DOCUMENT RESUME

ED 360 429 UD 029 363

AUTHOR	Natriello, Gary; And Others
TITLE	Matching School Resources and Student Needs: Scheduling and Assignment Problems in High Schools Serving At-Risk Youth. Final Report.
SPONS AGENCY	Department of Education, Washington, DC.
PUB DATE	Mar 93
NOTE	174p.
PUB TYPE	Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)
EDRS PRICE	MF01/PC07 Plus Postage.
DESCRIPTORS	Ability; Class Size; Course Selection (Students); *Disadvantaged Youth; Educational Practices; *High Risk Students; High Schools; High School Students; Low Achievement; Needs Assessment; *Scheduling; *Student Motivation; Student Needs; Student Placement; Time Management; *Urban Schools

ABSTRACT

By studying the process by which disadvantaged and low-achieving high school students are assigned to classes and special programs, how and why disadvantaged students are placed in inappropriate programs can be understood. Reasons exist to question the assumption that students are assigned to programs rationally on the basis of information about abilities, performance, and interests. Ideal characteristics of scheduling processes were identified based on the literature, and compared with practices in four urban high schools. Multiple methods of data collection, including interviews, reviews of school records, and observations of events related to scheduling, were used. Findings from the four schools indicate the degree to which each conforms or deviates from the following ideals of assignment: (1) appropriate for ability level; (2) class size appropriate for the type of instruction; (3) courses that fill graduation and college admission or employment requirements; (4) times that students are likely to attend; (5) effective teachers; (6) course assignments made before the beginning of the term; and (7) programs match student interests and needs. Recommendations for improvement of the assignment process are made. Thirty-six figures illustrate the discussion. Three appendixes contain interview questions, the interview format, and a course change form. (SLD)

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Matching School Resources and Student Needs: Scheduling and Assignment Problems in High Schools Serving At-Risk Youth

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Final Report

Project Number
R117E10173

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Matching School Resources and Student Needs: Scheduling and Assignment Problems in High Schools Serving At-Risk Youth

The study reported here was designed to produce new knowledge about strategies for making high schools more responsive to disadvantaged students. By studying the process by which disadvantaged and low-achieving high school students are assigned to individual classes and special programs, we have begun to identify how and why disadvantaged students are placed in high school courses or special programs which are inappropriate for their needs. The outcomes of this study include both improved understanding of the processes by which students are assigned to courses in comprehensive high schools and specific recommendations for helping schools to improve the match between the academic needs of disadvantaged students and the courses and programs to which they are assigned.

As society has placed more demands on the comprehensive high school, its organization has become progressively complex. The modern high school is organized not only around academic courses and curricular tracks, but also around structural sub-units such as mini-schools or thematic "houses." Contemporary high schools also incorporate a variety of special programs, such as dropout prevention programs or programs for teenage parents, designed to meet students' academic, social, and/or personal needs.

The increased differentiation of school services poses new challenges for the assignment of students to courses and programs which are most appropriate to their needs. When high schools served relatively homogeneous populations of students, the process of matching students to courses and programs was straightforward. The diversity that currently exists in students' academic and social needs and in the courses and programs that high schools offer makes this matching process both more important and more difficult. In the best of circumstances, a bad match simply places student learning on hold; but in the worst case, a bad match can drive students out of school ill-prepared for what lies ahead of them.

Much of the literature on assignment processes in high school concerns the advantages and disadvantages of tracking and ability grouping (Alexander, Cook, & McDill, 1978; Gamoran, 1988; Oakes, 1985; Rosenbaum, 1980). This body of research generally assumes that tracking is *intended* to be a rational process, with students placed in tracks on the basis of their academic abilities, prior performance, or interests, so that they may receive instruction that is appropriate to their needs and expectations.

There has been serious criticism of high school tracking practices, most of it focusing on four aspects of the problem: (a) the tendency for minority group members to be disproportionately placed in low-level tracks or ability groups (Oakes, 1985; Vanfossen, Jones, & Spade, 1987); (b) inequalities in the content, pacing, and methods of instruction offered to students in different tracks (Gamoran & Berends, 1987; Oakes, 1985; Rosenbaum, 1980; Shavit & Featherman, 1988); (c) the likelihood that once a student is placed in a track, he or she is seldom moved to another track despite improvements or declines in performance (Rosenbaum, 1976; 1980); and (d) the tendency for students in different tracks to have very different rates of high school graduation, and college attendance (Alexander & Cook, 1982; Alexander, Pallas, & Holupka, 1987; Bachman, Green, & Wirtanen, 1971; Oakes, 1985).

The present study examined a fifth problem with assignment processes in high schools, especially as they apply to disadvantaged and at-risk students, by questioning the assumption that students are assigned to classes, tracks, structural sub-units, or special programs according to adequate information on a range of valid selection criteria. If decisions about student placement are based on weak or missing evidence, then the negative consequences of those decisions take on added significance.

There are several reasons to question the assumption that high school students are assigned to courses and programs rationally on the basis of information about their abilities, performance, or interests. First, a recent review of national and local efforts to evaluate programs for dropouts and disadvantaged youth (Natriello, McDill & Pallas, 1990) suggests that it is often not known how students are selected to participate in programs. A series of evaluations of alternative dropout prevention programs in New Jersey (New Jersey State Department of Education, 1989) reveals that program administrators themselves are often unable to specify how students were selected to participate in a particular program. If administrators cannot articulate how students are selected to participate in school programs, it is difficult to argue that students are selected on the basis of ability or other systematic criteria.

Second, large scale studies of track placement invariably find that most of the variation in track placement cannot be explained by conventional measures of ascription and achievement. While social background factors and prior academic performance and coursework may help to explain why some youth enter a college preparatory track and others enroll in a general track, these factors rarely account for more than 40% of the variation in track placement (Alexander & Cook, 1982; Rehberg & Rosenthal, 1978). The startling implication is that other, unmeasured factors are more important than prior academic success in determining high school track placement.

Third, an initial examination of the procedures used to assign students to classes in urban high schools suggests that those responsible for making such assignments may lack the necessary information on student ability and background to make appropriate assignments (More Responsive High Schools Project, 1990). Counselors and administrators report that they lack two kinds of information necessary to assign students to classes that are likely to meet their needs -- aggregate information on age-classes of students and performance information for individual students. We examine each of these information needs briefly.

In order to develop a school's master schedule with an appropriate number of sections for each course, especially when students are assigned to courses by ability level, school administrators need to know the ability levels and prior performance histories of entire age-classes of students. Yet administrators report that they often lack such information at the time when decisions about the master schedule must be made. For example, in planning the next term, administrators may schedule the same number of course sections of Algebra II as there are course sections of Algebra I in the current term, without knowing whether the students currently enrolled in Algebra I have the requisite skills or inclination to succeed in Algebra II.

This situation may be even worse when planning a master schedule for students not currently enrolled in the high school. Administrators and counselors may not have *any* information on the abilities or performance histories of incoming students. As a result, decisions about the configuration of course offerings often follow long-standing tradition or at least the previous year's configuration. This often results in a master schedule that provides fewer courses of some kinds and more courses of other kinds than are eventually needed by the incoming group of students. Some courses become overcrowded, while others are undersubscribed.

Problems in planning the appropriate instructional offerings to meet student needs are even more difficult in schools serving disadvantaged populations because such schools often must deal with large numbers of transfer students. Indeed, in some urban high schools hundreds of students may enter and leave in a single month (Fine, 1987). Schools are seldom in a position to assess the shifting needs of changing groups of students on an on-going basis.

Once a master schedule is devised, in order to make appropriate assignments of students to courses and tracks, school guidance and counseling staff need information on the performance of individual students. This information is needed at the time when course scheduling is completed, but administrators and counselors report that they often lack such information. For example, staff from one high school report that students are scheduled in August and September, but that guidance counselors do not receive information on standardized test performance until November (More Responsive High Schools Project, 1990). This leads to the rescheduling of students in the middle of the semester. In schools serving disadvantaged populations this rescheduling process may consume large amounts of counselor time, leave teachers with constantly changing classes of students, and frustrate and confuse the students themselves.

The Educational Consequences of Course Scheduling and Program Assignment Problems

Scheduling and assignment problems in schools serving at-risk youth can diminish the quality of the educational experience for large numbers of students in various ways. To appreciate these problems from the perspective of students in the school, we briefly consider seven characteristics of an ideal scheduling and assignment process that *would* meet the needs of at-risk youth and how this process can break down in high schools serving at-risk youth.

1. Students would be assigned to courses or thematic programs in which the level of academic instruction is appropriate for their level of ability.

The courses and special programs most likely to engage and retain student interest and effort are those in which the level of academic instruction challenges but does not frustrate students. If the level of instruction is either too low or too high in terms of previous achievement of the student, the student is more likely to become disengaged and either participate at a low level or drop out of the course, program, or school. This is particularly true of at-risk youth who typically lack the personal and familial resources to deal with assignment to inappropriate educational experiences.

2. Students would be assigned to courses in which the size of the class is appropriate to the type of instruction that must occur.

When schools are not able to anticipate the number of students requiring certain types of classes, some classes become too large and others become small as counselors attempt to match courses to student needs. However, when students are in classes that are too large, the quality of instruction may diminish as teachers struggle to maintain control and serve the needs of large numbers of students simultaneously.

3. Students would be assigned to the appropriate combination of courses to fulfill graduation requirements and requirements for college admission and/or employment.

When schools serve middle class populations, especially those in which the vast majority of students complete high school in four years and go on to college, there is often limited diversity in the course requirements of students. Such schools are able easily to create individual student schedules that meet the immediate and future needs of students. However, in schools serving large numbers of disadvantaged students, the needs of individual students vary widely, based on great differences in the rate of passing courses and making progress toward graduation, and in the number of courses that students can manage each term. For example, should a high school sophomore who passed only four of eight courses the prior year be scheduled for eight courses again, in order to catch up on credits missed, or fewer courses, on the assumption that he or she will pass about the same number each year? Such decisions determine whether students receive course schedules that are tailored to their performance patterns, that enable students to move toward graduation, and that provide opportunities for students to succeed to the greatest extent possible.

4. Students would be assigned to courses at times when they are most likely to attend them and perform well.

For a variety of reasons, including the need to work and/or care for family members, disadvantaged students often experience difficulty attending schools for the standard school-day schedule. As a result, the configuration of a student's schedule can often make the difference between having an opportunity to complete required courses and not having such an opportunity. For example, when students who routinely arrive late for school are assigned to required courses that meet during the first period of the day, their chances of successfully completing course requirements are severely diminished.

5. Students would be assigned to courses taught by teachers with whom they can work productively.

At-risk students sometimes experience difficulty in their relationships with teachers when they are unable to meet teacher expectations for class attendance and performance, or when other clashes occur. Even a small problem between a student and teacher can become magnified when it is not resolved, and this is an all-too-common occurrence in schools serving disadvantaged students. An appropriate course scheduling process would avoid placing students in courses taught by teachers with whom they have a history of non-productive relationships. At the very least schools should avoid placing students in courses with teachers who have previously given them a failing grade. Yet there are often no provisions in scheduling practices to avoid such course placements.

6. Course assignments would be made for students before the beginning of the term.

Urban schools serving disadvantaged and at-risk students often have great difficulty beginning the school year with a stable master schedule and stable student schedules. Last-minute changes in the number of teachers assigned to the school disrupt the master schedule. Problems in data processing result in students and teachers not receiving schedules or class lists. And all of the contingencies discussed above (e.g., later-arriving test scores, overcrowded classes, student mobility in and out of school throughout the school year, scheduling conflicts among required courses, etc.) lead to schedule change requests from students, parents, teachers, and counselors. The resulting inability to start the term in an orderly fashion often sends a powerful message to students that they need not take their courses seriously for several days or even weeks. The net result is a loss of valuable instructional time.

7. Students would be assigned to special sub-units or programs that match their academic, personal, and/or social needs.

Many schools, especially those serving disadvantaged and at-risk youth, have established special programs to meet student needs, ranging from dropout prevention or recovery programs to special guidance programs to health care clinics. When schools lack specific information on student needs, students are assigned to such programs on the basis of known, general characteristics such as overall academic performance or having a history of disciplinary problems. In such instances, it may be difficult to achieve a match between student needs and program resources. However, if schools had more detailed information about student needs, they might be able to tailor special programs more closely around those needs.

When students are assigned to courses that do not match their abilities, when their schedules do not contain the courses they need to graduate and continue their education or enter the workplace, when they are assigned to classes taught by teachers with whom they cannot establish a productive working relationship, and when the special programs to which they are assigned do not specifically address their needs, they are denied the opportunities and resources for success in high school. Disadvantaged youth in this situation are deprived of the education they need to overcome their disadvantages. They are less likely to become fully engaged in the school program and more likely to drop out of school prior to graduation.

It is important to understand that, even though a school's professional staff may be committed to educating at-risk youth, problems of course scheduling and program assignment may deprive at-risk youth of an appropriate education. The problem and the solution to this dilemma reside in the system of course scheduling and program assignment. The current project documents the problems with current course scheduling and assignment practices in high schools serving disadvantaged youth and examine some initial solutions that will give at-risk students appropriate opportunities to complete their high school education.

Method

The project has several critical technical features. First, we studied scheduling and assignment practices in four different high schools. The use of multiple sites allowed us to assess the range of variation in practices across urban high schools.

Second, we used multiple methods of data collection. We conducted interviews with school staff involved in the scheduling and assignment process as well as with teachers whose course enrollments are affected by the scheduling and assignment process. We also examined existing school records documenting requests for schedule or program changes. Finally, we conducted observations of critical events related to scheduling in each of the high schools. Such events differed in each school; in one school we observed the planning meetings that led to the adoption of arena scheduling as well as the actual scheduling session itself, in another school we observed meetings of staff planning modifications of a new student information system. In the complex social world of a high school, there are multiple realities, and the use of multiple sources of data allowed us to see these more clearly.

Third, the proposed project examined the process of course and program assignment in high schools as an *institutional*, rather than *individual* process. Most previous work on curriculum tracking and coursetaking patterns has relied on surveys and interviews of individual students. While this literature has succeeded in describing the educational consequences of various tracking systems, it has made few inroads in analyzing how assignment systems arise in the first place. Garet and DeLany (1988), in one of the few published institutional analyses, make this point quite clearly: "In a full analysis, attention should be given not only to the routes students take through these choice points but to the decision processes that are involved. Thus, for example, questions need to be asked about the participants in the decision process, standard operating procedures, information, preferences, and constraints" (p. 75). The institutional focus of the present research can illuminate our research questions in ways that student surveys are ill-equipped to do.

Research Sites

The staff of the proposed project documented the problems in the course scheduling and program assignment process in four high schools serving at-risk youth in the metropolitan New York City area. Two of these high schools, those we call Jefferson High School and Washington High School, are part of the New York City public school system. The other two high schools, those we call Lincoln High School and Roosevelt High School, are in urban centers in New Jersey. Each of these schools has a student body that is largely composed of at-risk youth. Brief descriptions of these schools are contained in sections of this report that focus on findings at each school. These schools are members of an on-going research and development consortium organized through Teachers College and designed to develop More Responsive High Schools for Disadvantaged Students. Each of these schools has acquired or is in the process of acquiring the requisite in-house computer capacity to manage student information more effectively, but each could benefit from consultation on the social and practical barriers to using such information to improve the student assignment process. Staff members from these schools have participated in the design and implementation of a staff survey of information needs in the schools (Pallas, Natriello, and Riehl, 1990) supported by The Center for Research on Effective Schooling for Disadvantaged Students at The Johns Hopkins University.

Data Collection Activities

To achieve our objective of documenting the problems in the course scheduling and program assignment process in these high schools, we engaged in four major data collection activities. First, we conducted interviews with those school staff most directly involved in the assignment process itself. Such individuals generally included school administrators with direct responsibilities for developing student schedules, guidance staff or grade advisors who work with students to develop schedules, and department chairpersons. These rather lengthy interviews focused on the development and management of programs and courses or segments of the high school curriculum, coordinating or determining the mix of courses, programs, and services for students, the actual processes of assigning students to course, programs, and or services, and providing information on students to support the assignment process. The interview protocol for these interviews is included as Appendix A of this report. We conducted an average of twelve interviews of this type in each school.

A second data collection activity involved somewhat shorter interviews with classroom teachers who deal with the results of the scheduling process in their classrooms. At each of the four high schools at least two teachers from the English, mathematics, science, social studies, and vocational departments were interviewed. The interview protocol for these interviews appears in Appendix B of this report.

A third data collection activity made use of existing school records to identify those students whose schedules or programs were altered during the 1991-92 school year in response to a request from a student, a parent, a teacher, or a counselor. We examined these requests to determine which of them were attempts to correct problems in the original assignment of students to courses or programs. This data collection activity represented the greatest departure from our original plan. Although we anticipated a large number of course and schedule changes, we did not anticipate that the volume of such changes would exceed the number of students in the student body in some cases. As a result we underestimated the demands that collecting additional data as part of the course change process would place on school staff as well as the additional demands that coding and analyzing such data would place on the research staff. The latter problem simply resulted in a dely in completing the analyses and preparation of this report. The former problem required us to adapt our procedures to the needs of the four schools. In some cases this meant using simpler forms routinely used by the school to collect information on changes rather than our own more extensive and more time-consuming form. In other cases, it meant simplifying our supplementary forms. In still other cases we replaced the forms normally used by a school with our own forms printed on multi-part paper to allow school personnel to complete forms for school records and for our research project simultaneously. An example of one such form is included in Appendix C of this report.

A fourth data collection activity was also tailored to the individual schools. This activity involved observations of critical events related to the scheduling process in each of the schools. Such critical events varied from in number and kind in the four schools. At least two such events were recorded for each of the four schools, but as many of six such events were observed in other schools. In addition, in two of the schools project staff worked with school personnel to investigate problems in the scheduling process and design solutions to such problems. This kind of active engagement with school staff enabled us to gain insights into the dilemmas of the scheduling and assignment process that go beyond what we were able to discover in the course of the two sets of interviews.

This report represents our first attempt to summarize and synthesize the results of our research activities in the four high schools. As such it provides an initial examination of a rather complex set of data covering a series of complex institutional processes that come together in the activities associated with the scheduling and assignment of students to courses and programs. These processes have multiple dimensions, some political, some financial, some social, and some quite practical. We view the individual reports on the four schools and the concluding sections that synthesize these school-level findings as the first words, not the last word, on our study of these interesting and important processes in the lives of schools and students.

Results for the Four High Schools

Jefferson High School

Overview of Jefferson High School

Jefferson High School is one of several alternative high schools in a large urban school district in a Northeast city. It occupies space on the third and fourth floors of a building that also holds a public middle school. Its neighborhood has over many decades provided tenement housing for immigrants; today, drug abuse and homelessness are major problems in the community.

The school's student body consists largely of immigrant Asian students who need to learn English and earn their high school diplomas, as well as other students, mostly African-American, who have been expelled or discharged from other high schools, especially a comprehensive high school located in the same neighborhood. Many of the school's approximately 575 students are limited-English proficient, and they tend to be older than average students in their grade levels. Because they often enter Jefferson High School from another high school, either in the United States or in a foreign country, students typically do not spend a full four years at Jefferson; two or two and a half years is the average. The school strives for a balance in immigrant and transfer students in the area of a 65% - 35% ratio.

The school obtains students from a variety of sources. Some students are referred through word of mouth; they hear about the school from family members, friends, and so on. The school also places advertisements in local papers, especially Chinese-language papers, about dates for registering for the school. Students are referred from other high schools and from social service agencies. It is quite rare for a student to come to Jefferson High School directly from a junior high or middle school.

The school staff is small, and there is a sense of closeness among the staff, and between staff and students, that sometimes seems lacking in larger schools. Staff members are engaged in a number of collaborative projects. Every morning, the entire staff gathers in the school library for a brief meeting known as "muster," in which announcements are made and students are sometimes discussed. The school is one of several schools in the district developing a comprehensive restructuring plan, and it has an innovative staff development program as well. Recent school improvements have focused on creating a more flexible student schedule, a family model of group counseling services for students, a jobs program, and additional cocurricular activities for students. Staff have also tried to develop greater coordination among the different curricular divisions in the school through several interdisciplinary "house" programs in the school.

The Curriculum at Jefferson High School

Jefferson High School offers a fairly standard academic curriculum to its students. The focus of the school is on helping students make up courses required for graduation that they either failed or didn't take in their previous high schools. Thus, it is a "bare-bones" curriculum, with few electives. Requirements are said to drive the curriculum. Students need forty high school credits to graduate, with each term of a course counting for one credit.

With a few exceptions, there are not enough sections of most courses in this small school for students to be grouped by ability. The main grouping into classes that is done is according to language proficiency. Bilingual sections of classes are offered in mathematics, social studies, and science. In minor subjects, translators are available when needed. Staff report that the bilingual sections of classes seem to have students performing at higher ability levels, since many of these are Asians who did well academically in China but must still learn English.

Many courses are organized in sequences, with lower-sequence courses functioning as "prerequisites" for the higher-sequence courses. However, as will be described below, prerequisite requirements are often ignored or passed over in attempting to give students reasonable class schedules. Since many students are older and don't spend four full years at Jefferson High School, it is even harder for the school to enforce regulations about prerequisites.

Jefferson High School has several mini-school programs or "houses." There is a house for immigrant students who are performing at a low level and are at risk of dropping out. The house has three ESL teachers, and teachers for social studies, math, art, and music, as well as a paraprofessional. About 60-85 students are enrolled in this program. The staff attempts to integrate the curriculum and also tries to meet together weekly to discuss individual student needs. Students in this house take their ESL, social studies, and math courses together, separately from the rest of the school, but they join other students for their other courses.

The Performing Arts Program is another mini-school program, which attempts to combine academic instruction with a special focus on the arts. Students enroll in three classes per term as part of this program. The third mini-school program also incorporates an interdisciplinary focus; students spend five periods a day in this program. The coordinators of both of these special programs are actively engaged in selecting students for the programs. They go through student records and talk with students in class settings in an effort to find students who they feel will be compatible with the aims of the programs. One unique aspect of both of these mini-school programs is that students are scheduled for general courses such as "Performing Arts English" or "House Social Studies," but they are then given transcript credit for particular courses, such as Global Studies II, which they need in order to graduate. This practice increases flexibility for the students, but it necessitates a careful examination of student transcripts after the semester has begun.

Following are brief descriptions of the curriculum offerings in major subject areas at Jefferson High School.

English.

The department which offers the most electives at Jefferson is the English Department. While students must take a certain number of English courses to graduate, there are no particular courses which must be used to fulfill this requirement, so the school staff is free to offer a variety of courses. There are several writing courses, and literature-based electives such as science fiction, mythology, short stories, and drama. Several speech courses are also offered. Several elective offerings, particularly science fiction and mythology, are geared toward more able students, while a beginning-level course in the short story is geared to beginning English speakers.

Some English courses are "crossovers" in that they are geared to students with varying levels of different skills. For instance, the class in narrative writing is designed for students with poor writing skills, but some of these students may have high levels of reading or verbal skills, while others may have very low levels of the same skills.

Mathematics.

All of the mathematics courses offered at Jefferson High School are part of the state-mandated mathematics curriculum, with the single exception of advanced placement calculus. The school offers AP Calculus even when only a few students register for it. The curriculum itself has two levels, but individual courses are not divided into sections with students grouped by ability; there are not enough sections of any course to permit this.

Fundamental math is the low-level mathematics course. Typically, this course is taken by students who have not passed the state-mandated competency exam (known as the RCT). The school offers the course as a two-semester sequence when possible. Students with higher math skills would take Fundamental Math II, while students with lower skills would take Fundamental Math I. The benefit of offering a two-semester course is that students could take the second semester course, and if they failed it (or failed the RCT exam), they could then go backwards and take the first semester of the course but still get an additional math credit for it.

"Sequential math" is the main mathematics curriculum. It is a three-year sequence, and it replaces the standard algebra-geometry-trigonometry sequence by integrating all three topics into each year's course. At Jefferson, the first year of sequential math is offered as a three-term sequence, to give students more time to learn the material.

Each math course has the previous level course as its prerequisite. Students can skip the prerequisite courses if their ability levels seem high enough. However, staff are concerned that students don't begin with high level math courses and then find themselves with no other math classes to take, but with the need to earn additional math credits in order to graduate.

All of the sequential math classes are offered in bilingual sections and English sections.

Science.

Ninth-graders at Jefferson High School take a year-long course in physical science which prepares them for the state's competency test in science. This course assumes some background in biology and earth science in middle school. From there, students take courses in the science disciplines. Each term, multiple sections of a course in earth science and one in biology are offered; generally, only a single section is offered of chemistry and physics. Students are required to take two years of science for graduation; it is rare for students to take more than three years of science.

There are no electives offered in science, and there is no ability grouping in science courses. As one staff member remarked, students tend to sort themselves by their perceptions of their own abilities, so that only the brighter students take chemistry and physics.

Social Studies.

The state-mandated curriculum in social studies includes a four-course sequence in global studies, a year (i.e., two semester-long courses) of American history, a course called "Participation in Government" and one in economics. All of the courses except economics are required for graduation. Many students at Jefferson transfer into the school with most of their other graduation requirements filled but with the need to take four or more social studies courses. Foreign students are often given transfer credit for two courses from their native country, but they typically must still take American history. Therefore, social studies courses are a major part of the curriculum at Jefferson. Three of the four courses in global studies (not the last term) and both American history courses are offered in bilingual instruction.

Theoretically, students must take American History I before American History II. The order of the first three global studies courses is not important, but all three should be taken before Global Studies IV. However, taking social studies courses in the preferred order is not always possible at Jefferson. Sometimes students cannot be scheduled for the courses they need when they need them, and may find that the most efficient alternative is, for example, to take several social studies in one term and several English courses in another term. Sometimes students aren't in the school long enough to take courses in the preferred sequence, so they may sometimes take American History II before or at the same time as American History I.

English as a Second Language (ESL).

With the large number of immigrant Chinese students enrolled at Jefferson, there is a large ESL component to the school curriculum. Six terms (three years) of ESL instruction is offered. Students who take English as a Second Language must also take a special English class at the same time; these are known as seminar English classes. Once a student passes out of ESL classes (by virtue of performance on a language assessment test), the student is required to take three terms of regular English classes, to give them sufficient exposure to the language. This poses a difficulty for students who are enrolled in Jefferson for only one or two years; they sometimes have to take three English classes during the same academic term.

Placement of students in the appropriate level of ESL instruction can be difficult. A teacher may decide that a particular course level is too hard for a student, but if the student has taken the previous level before, for example at another school, the student cannot be re-enrolled in that level. Some staff members feel that students at Jefferson should have the opportunity to take more than six courses in ESL instruction, but there is resistance to this idea by other teachers who feel the students should be exposed to more English and should take more classes with American students.

The double scheduling of an ESL class and a seminar English class poses problems. The computer scheduling program does not recognize this requirement, so students are frequently scheduled for their ESL class but not the seminar English class. Thus, a schedule change is necessitated. In a recent semester, staff members reported that there were four English seminar classes for about seventy ESL students, and the students were not scheduled for the seminar class on the basis of their language proficiency. A great deal of juggling of students had to take place before this problem was resolved.

Other Curriculum Areas.

Students need one credit in art and one in music in order to graduate. Jefferson High School offers a few electives in each of these subjects, for example a course in the history of rock and roll and a course in computer art.

Because many of Jefferson's students are Asian immigrants, there are courses in Chinese as a native language. The only other foreign language offered is Spanish.

There is no self-contained special education program at Jefferson High School, only Resource Room services for students enrolled in regular education classes. Fewer than a dozen students at Jefferson are enrolled in Resource Room.

Finally, the curriculum at Jefferson includes several courses that are essentially group counseling or advisement. Entering students take a one-semester class called "Stage." This class is considered very important because staff report that the school loses many students in their first term. After this course, students can take a course called Human Dynamics, or one focusing on peer leadership and drug abuse prevention. Students who enter Jefferson with twenty or more credits often forego the Stage course and enroll in the Human Dynamics course.

The Scheduling and Assignment Process at Jefferson High School

On the basis of interviews with staff members, as well as participant observation of some activities, we have developed the following description of the scheduling and assignment process at Jefferson High School during the 1991-

92 school year. This is a process that takes place on an almost continuous basis throughout the school year rather than at any discrete time, but there are distinct stages of the process. The 1991-92 school year was unique at Jefferson because the entire scheduling process changed between the fall and spring terms. First, we will describe the process as it occurred during the fall term, and for several years prior to that term.

Building the Master Schedule.

The first step in the process that ultimately results in matching students with classes is to create the school's master schedule -- the set of courses that will be offered in a given academic term, the number of sections of each course that will be offered during specific class periods, and the teachers who will teach the different sections of the courses.

At Jefferson High School, there is a staff member who teaches several classes but also is released from instructional time to coordinate all scheduling activities; this staff person is known as the program chairperson. The program chairperson initiates the development of the master schedule each term by giving to the department coordinators (the school is too small to have official assistant principals of each department) a list of courses currently offered by the department, along with a listing of other potential courses they might offer, for example courses that were offered during previous terms. The coordinators return to the program chairperson a list of courses which they would like to offer in the upcoming term; this is reviewed by the principal and assistant principals in the school. The list of possible courses then is distributed to teachers, who submit their preferences for the courses they would like to teach and the periods during which they would like to teach them. These "preference sheets" are not binding but are used to guide the planning decisions of the departmental coordinators and the program chairperson.

After this "first pass" at developing a master schedule is completed, there is a period of time during which students are preregistered for classes; grade advisors and students participate in choosing the courses they are most likely to need during the next term. Preregistration for the next term usually takes place one or two months before the end of an academic term. With this information in hand, the program chairperson then develops tallies of how many students are likely to enroll in each course and can determine how many sections of each course to offer. The chairperson can also determine where class conflicts are most likely to occur, that is, where students will have difficulty getting scheduled for all the courses they want to take. Once the course tallies and potential class conflicts are known, departmental coordinators make their final selection of courses to offer and assign teachers to the courses. The school principal once again goes over these selections and makes adjustments that seem appropriate.

Most staff members interviewed seemed to agree that the master schedule at Jefferson High School is quite stable from semester to semester and year to year. Only incremental changes tend to be made. In part, this is because, according to some staff members, it is hard to engage teachers in offering new courses; they are more willing to teach courses for which they have already planned. Also, however, the school is small and can offer only a few courses in addition to the regularly required high school curriculum. However, although the courses which are offered tend to change very little, there is more volatility in the number of sections of each course which are offered. One main reason for this is that new entrants to Jefferson High School are not always ninth-graders with no previous high school experience, as would be the case in most academic high schools. Instead, the entering class could be primarily immigrant Chinese students one year, and mostly dropouts from a neighboring high school the next. The school staff try to predict what the entering class will look like as the master schedule is developed, but occasionally the process runs awry. One staff member described a time when the estimates for how many ESL classes would be needed were far from what actually was needed.

One staff member who was interviewed complained that there is rarely any effort at the school to examine the entire master schedule in a holistic fashion, and to coordinate the program of offerings. This is not surprising, since departmental coordinators appear to work independently in deciding what courses to offer.

Jefferson High School is part of a large urban school district and is influenced in many ways by matters at the district level. In the fall of 1991, the school district had to initiate significant budget cuts, and the specific nature of these cuts were not known before school opened. Thus, the school administrators did not know how many teachers they would have on staff and could not complete the development of the master schedule for the fall term. This problem delayed all other aspects of the scheduling and assignment process.

Assigning Students to Courses.

Once the master schedule is finalized, students are officially scheduled for the next term's classes. This stage of the process typically occurs soon after the second report card period in a term. First, students select the courses they want to take. At Jefferson, there is a "course selection week" during which students indicate the courses they want to take on a form, and then take this form around to their current teachers, who sign the forms to indicate that the students have chosen appropriate classes. Students' grade advisors go over the course selections with them (sometimes they select courses for students on their own, especially for chronically truant students). Generally, grade advisors use the second marking period report card grades to predict whether students will pass their current courses and be eligible for the next higher courses.

Student course selections are recorded on machine-readable forms and are submitted to a central district computer center for scheduling. At this point, the computer generates programs for students which are far from perfect. In many cases, the computer is unable to schedule all courses which the student has requested, leaving "holes," or unscheduled class periods, in student schedules. One grade advisor reported that she always requests more classes for students than the students want, on the premise that several will not be scheduled by the computer anyway.

Staff members report other problems at this stage. The computer will ignore requests for minor subjects which students may really want to take in order to schedule major subjects which students must take. Or, the computer may ignore special curricular requirements, such as the one noted above where ESL students must be scheduled for two different classes, an ESL class and a seminar English class. Overall, after the computer has scheduled students, virtually all of the students' schedules must be checked for problems and many of them will in fact have problems requiring adjustments. Moreover, this process occurs under the constraint of time, since Jefferson High School is assigned limited times during which it can use the district scheduling program. These times do not always coincide well with grade advisors' schedules for meeting with students to resolve problems.

The school may go through several iterations of the computer scheduling program in order to obtain the best schedules for the greatest number of students. After this point, all scheduling is done by hand.

Scheduling New Entrants to the School. The process described thus far applies primarily to students currently enrolled in the school. In most cases, grade advisors have access to transcript information and report card information on these students which can help guide course selection. The process is somewhat different for students who are new to the school, for their first term at Jefferson.

Administrators and grade advisors at Jefferson High School do not know much about their new students each term, because they do not have an automatic base of entrants such as a regular high school which admits students from a neighborhood middle school might have. Students come to Jefferson from foreign countries, or they may be direct transfers from other area high schools, or they may be students who have dropped out of school for a while. At any rate, staff try to admit new students as early in the spring semester as possible, for enrollment the following fall term. In the spring of 1991, Jefferson was successful in this regard: it was reported that the "class" of new entrants was finalized by the second week of February, instead of at the end of March as had been the case during the previous year.

In general, staff at Jefferson try to have schedules ready for new entrants by the first day of school in the fall. In some cases, this requires that staff must schedule students on the basis of their records, with or without interviewing the students.

For those new entrants who have had no previous high school experience, the school assigns them to a set of basic courses. Most of their course selections are determined by their level of proficiency in English. Students will take ESL classes if they are needed, along with global studies, an art or music class (some grade advisors try to ask students their preferences, since this is one area in which students actually have some choice), math, and possibly a Chinese language class. New students are typically assigned to a maximum of six credit-bearing classes, plus lunch.

If students are admitted with no transcript information or test scores in language or math, they must take placement tests. If they passed a math course in another school, they would get the next course in the sequence without being tested.

Students who come to the school from another local high school are typically scheduled for the next course in each curricular sequence, i.e., math, English, and so on. The goal is to fill gaps in student transcripts so they can graduate as quickly as possible. Students who come to Jefferson from foreign countries are much harder to schedule. These students generally either do not have a foreign transcript in hand, or it must be translated, which takes considerable staff time. The guidance staff try to make appropriate course selections for these students, but changes must often be made as more is learned about students' previous school experiences.

Arena Scheduling: An Attempt at Change. Staff members at Jefferson felt that the standard scheduling process described above, which was used to schedule students for courses for the Fall, 1991, term, was seriously flawed and resulted in massive numbers of schedule changes for students. For the most part, the problems with the fall term schedules appeared to be out of the hands of school personnel. According to the school principal, many problems occurred because the school district instituted budget cuts that were not clearly spelled out before school started in September. Thus, the school could not finalize its master schedule, and staff could not come into the school as usual in late August to make adjustments to student schedules that were known to be flawed for the fall term. Other problems were caused by a chronic district-wide situation -- the late transmittal of summer school grades to students' regular schools. Thus, students who took and passed courses in summer school could not have quick adjustments to their class schedules. Other problems in scheduling during the fall of 1991 appeared to be caused by personnel changes in grade advisors -- new advisors weren't as knowledgeable about the scheduling process, and by the institution of two new houses, the performing arts and bilingual programs, within the school.

Whatever the causes, staff members felt that there was a need for a change in the scheduling process, and so they voted to try an arena scheduling method. In arena scheduling, students come one by one to choose classes from a master list of availabilities. There is no computer scheduling involved; once a class fills up, students can no longer choose it. Jefferson staff members believed that arena scheduling would have several main advantages. First, scheduling would occur right after the end of the fall semester, not in the middle of it, so that students and their grade advisors would know for sure whether students had passed their fall term courses. Second, there would be no problems with a computer producing only an incomplete schedule for students that would then have to be altered. Students would choose courses until their schedules were full, on the basis of full information about class conflicts, oversubscribed classes, and so on. Third, students would need to take more responsibility for understanding graduation requirements and choosing courses, a goal which Jefferson staff felt to be important.

Once the school staff voted to try arena scheduling, the process was quickly planned and implemented. Time was taken out of the instructional schedule in January for staff and students to be "trained" in how to read student transcripts, understand graduation requirements, and proceed through the steps of arena scheduling. Half of the students were scheduled for the arena on one day late in January, and the other students were scheduled for the following day. School staff were concerned that students would not show up for the arena process but just let their grade advisors schedule them at a later date, so various incentives were offered to encourage students to come. Approximately two-thirds of the students did actually come to the arena scheduling.

One problem with this first attempt at the arena scheduling process was that there was no form of preregistration, so the program chairperson had very little information to use in determining how many sections to offer of each course or how to schedule singleton and doubleton classes to avoid class conflicts. Right after the arena scheduling took place, this problem was recognized by more school staff and they resolved to obtain preregistration information in some way for following terms.

The actual arena scheduling process did appear to go fairly smoothly. As it turned out, not enough sections of the senior-level government class were offered, and some students were still mis-scheduled for ESL classes. In some cases, teachers who participated in the arena scheduling indicated that they did not understand graduation and scheduling requirements in all of the subject areas well enough to be able to help students. Other problems occurred, but the general feeling was that it had been a successful experiment, worth revising and trying again.

Making Adjustments to Student Schedules.

Inevitably, with both the traditional method of course assignment and the arena scheduling experiment, students have problems with their schedules that necessitate schedule changes. At Jefferson, there is a standard form on which students write their current class schedule and request changes. These forms are reviewed by the grade advisors and submitted to the program chairperson, who has final authority over all schedule changes.

School staff at Jefferson appear to try to be responsive to students' requests for class changes. One grade advisor commented that at Jefferson they try to make students happy so they will succeed. Changes in student schedules are automatic in cases where students have already taken and passed a course; this is not a rare event and typically it is the student, not a staff member, who catches the mistake. Another situation that results in an automatic course change is if a student is assigned to a class taught by a teacher who has previously failed the student; this is thought to be unproductive for both the student and the teacher. Grade advisors may also allow students to change courses that they feel are either too easy or too hard for them, but at least one advisor requires a note from the student's teacher concurring with the student's assessment. Sometimes students will want to skip levels of ESL, especially if they are approaching age 21 and will "age out" of the school. Again, this is allowed if teachers concur.

The one reason for student course change requests which generally is not honored is if a student simply does not like a particular teacher. Staff members reported in interviews that students often give elaborate reasons for why they want to change classes, when this is the true reason. Some grade advisors try to anticipate such problems and try to schedule students with compatible teachers; this is possible because many classes are offered as singletons and it is possible to know exactly who the teacher for a particular course would be.

School staff sometimes initiate schedule changes themselves, for example if a class has been canceled, if class sizes must be equalized, or if it comes to the staff's attention that a student needs a different class in order to graduate. However, it appears that teachers do not often request that students be moved out of the classes to which they are currently assigned. They may make recommendations about student placements for the next term, but generally teachers appear to adopt a "coping mode" with students and to accept the students they have been assigned, even if they feel the assignment is inappropriate.

Grade advisors, those staff members most closely involved in the schedule change process, report several constraints on their work. First, after the main round of scheduling, students must be scheduled for courses by hand. This includes late admits to the school as well as students requesting course changes. But the grade advisors must do this with incomplete information about which courses have been cancelled or have filled up. So they often make mistakes which require yet another round of schedule changes. In addition, grade advisors initially schedule students for classes on the basis of their second marking period grades. They know that if those grades differ significantly from final semester grades, for example if a student appears to be passing a course but eventually fails it, then the schedule for that student for the next term is likely to be inappropriate and must be changed. But teachers and grade advisors don't communicate regularly about student grades, so that it requires some effort for grade advisors to figure out which students will need a schedule change.

Staff members at Jefferson reported that schedule changes consume much staff time, especially for grade advisors and the program chairperson. Moreover, the shifting of students from class to class is disruptive for both students and teachers. At the very least, it delays the effective start of the academic term until student schedules are stabilized a bit and the school settles into a routine. One teacher reported that she got to line 44 of her roll book for a class that never had more than 25 students in it, indicating that 19 students had moved in and out of that class. For these reasons, it seemed appropriate to examine the specific nature of the schedule change process; the results of our preliminary investigation of this facet of the student course assignment process are reported in a later section of this report.

Overview of Staff and Student Roles in the Scheduling and Assignment Process.

Different players have different roles in the scheduling and assignment process at Jefferson High School, and in this section those roles are reviewed.

Students appear to have very little say in what courses are included in the master schedule, except insofar as their graduation requirements determine how many sections of different courses must be offered. They do play an active role in choosing courses, especially under the arena scheduling system. Some staff feel, however, that students do not participate fully in the course selection process, perhaps because so much of it is really determined by graduation requirements and is out of their hands. Students can initiate requests for class changes at Jefferson, and frequently do so. But even here, some staff feel that students are less involved than they might be. This staff member indicated that most students want a schedule change but only about half of them actually request one.

Teachers are invited to submit ideas for changes in the master schedule. While it was reported that such changes are not often presented because teachers prefer to teach existing courses, this may not be the full story at Jefferson, since teachers have been involved in developing three mini-school programs over the past few years. Teachers are asked their preferences for the scheduling of courses they would like to teach, but these preferences are not binding and the overall needs to cover the master schedule must be met. Teachers are formally involved in the process of assigning students to courses because they are supposed to discuss classes with their students during "course selection week" and to sign students' course selection forms. However, it was reported that often teachers don't take this process seriously, perhaps because there is not enough time to do so. Moreover, teachers report that they are often uninformed about curricular offerings or graduation requirements, especially in subjects that they don't teach but often even in their own subject areas. The arena scheduling process did involve teachers in a new way, because they helped to train students in how to read transcripts and select courses, and because they served in various ways at the actual "arena" site where scheduling took place.

Teachers are involved in the scheduling process in several other ways. First, the teachers who coordinate the special mini-school programs are actively involved in selecting students for their programs. Second, as was noted above, teachers on rare occasions will request that students be moved out of their current classes. Third, teachers sometimes informally learn what classes students are signed up to take for the next term and make recommendations about those classes to students. This does not happen often, though, according to teachers. It is interesting that in a school as small as Jefferson, teachers do not follow the academic careers of their students. This may be the case because those careers are so closely defined by requirements, or it may be that there is no easy way for teachers to get this information on their students or to intervene if they want to.

The school principal and departmental coordinators are primarily responsible for developing the master schedule and are less involved in the assignment of students to classes; they also do not get too involved in schedule adjustments.

Grade advisors have the greatest responsibility for the scheduling and assignment process. They have no special role in the creation of the master schedule, but much of their time is consumed by preregistering students for classes, then officially selecting classes with (or on behalf of) students, and finally making schedule changes. The paperwork involved is reported to be a burden, and the grade advisors must also stay on top of a considerable amount of information on students, from transcripts, report cards, and test scores, not to mention anecdotal information from teachers or information about the skill requirements of particular classes. Some staff members at Jefferson feel that grade advisors should receive more training or even an "internship" period, and that there should not be such turnover in the advisors, because it is such a crucial role in the scheduling process.

The Analysis of Schedule Changes at Jefferson High School

In order to better understand the nature and impact of schedule adjustments for both students and staff, we collected and analyzed data on student schedule changes during the fall and spring semesters of the 1991-92 school year at Jefferson High School. Three sources of data were used. First, we collected the forms which students and grade advisors submitted to the program office for requesting schedule changes. These forms were essentially the same ones that the school had used before, except that they were modified so that students could indicate the reasons for the schedule change requests. We also collected the computer-generated forms which the program chairperson produced once schedule changes were made, as well as a set of notes and other slips of paper showing other schedule change information that we received from the program office. From these various data sources, we recorded information on the students and their schedule changes. Each record in our data files represents schedule information from a single point in time for an individual student; therefore, students who had schedule changes at several different times have multiple records in the data files. We report here a preliminary analysis of these data, presenting results for the fall and spring semesters separately. This analysis is organized around a series of questions about the schedule adjustment process: 1) how many schedule changes were there; 2) when did schedule changes take place; 3) how were schedule changes distributed across grades; 4) which subject areas were involved in the schedule changes; 5) what were the reasons for the schedule changes, and 6) how intense were the schedule changes.

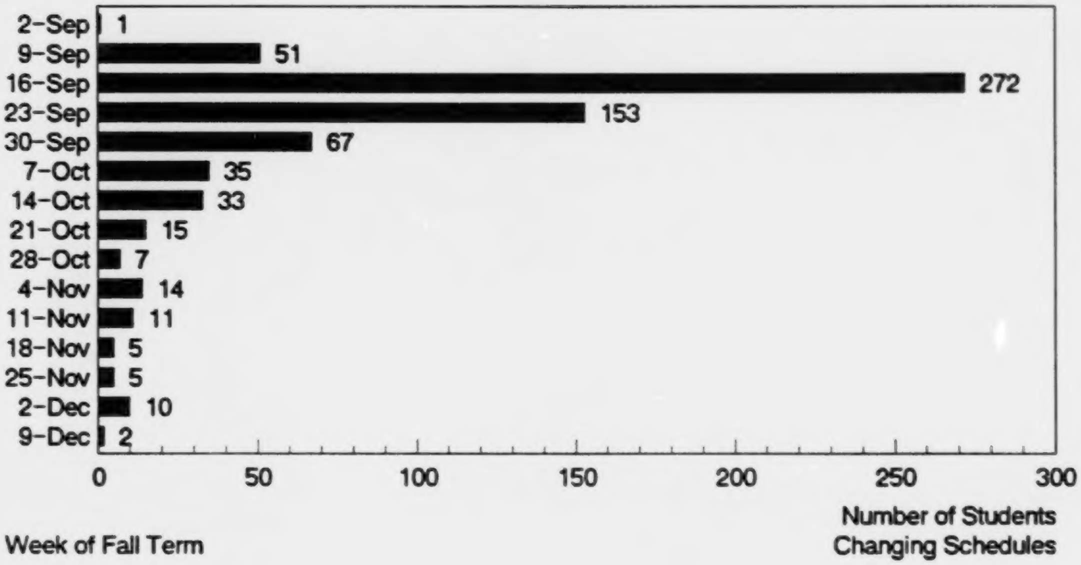
1. How many schedule changes were there at Jefferson High School?

In the fall term, there were 722 separate records of student schedules. Of these, 710 contained requests for schedule changes (sometimes changes were made that had not been requested) and 673 actually showed schedule changes (sometimes change requests were not granted). In the spring term, there were 891 separate records on student schedules, with 881 showing requests for schedule changes and 782 showing schedule changes. The sheer number of schedule change records is worthy of note. Jefferson High School enrolls fewer than six hundred students, and in both the fall and spring terms of 1991-92, there were far more schedule change requests than students enrolled. Most students had one or two schedule change requests per term, with a handful having as many as six or seven. In the fall term, 451 students submitted requests for schedule changes; in the spring term, 442 did so. In other words, each term over three-quarters of the students in the school requested a change in their class schedules.

2. When did schedule changes take place at Jefferson High School?

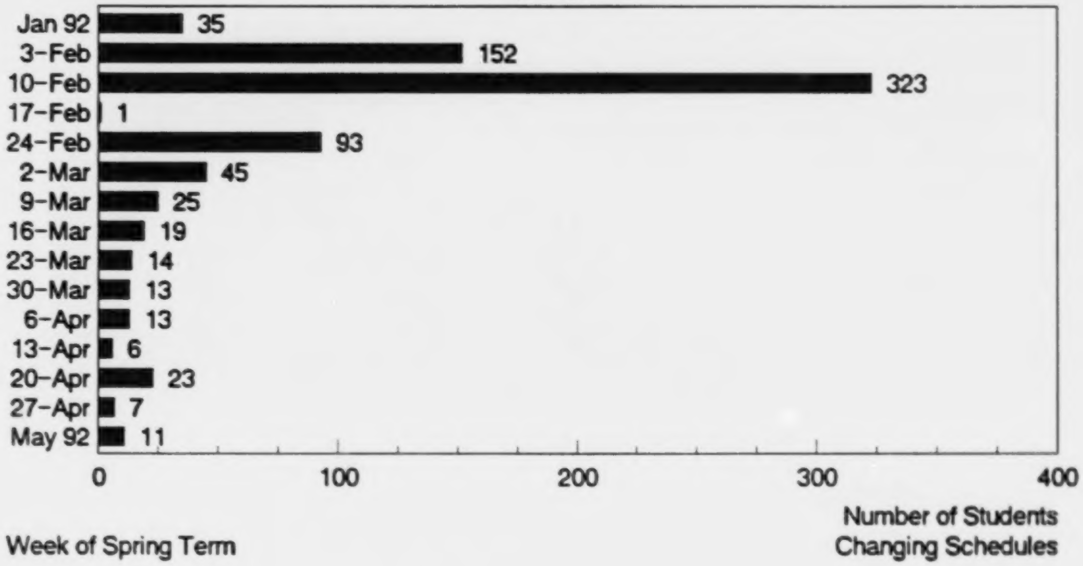
For the 1991-92 school year, first semester classes began the week of Labor Day, September 2nd, and second semester classes began the first week of February. We divided each semester into weeks and examined the distribution of schedule changes by week. Of the approximately seven hundred requests for schedule changes that were submitted during the first semester, 681 were dated. For the second semester, there were almost nine hundred requests for schedule changes; 780 of these were dated. Figure 1 shows the number of students with schedule changes by week for the fall semester, and Figure 2 shows weekly schedule changes for the spring semester.

Figure 1. Distribution of Schedule Changes at Jefferson High School Fall 1991



In the fall term, only one schedule change was processed during the first week of school, and fifty-one were processed during the second week. These records represent just seven percent of the total schedule changes for the fall term. The greatest proportion of schedule changes, forty percent (272 separate change requests), occurred during the third week of school. Half as many changes (twenty percent or 153 requests) were processed during the fourth week, and half again (ten percent, 67 requests) during the fifth week of school. Thus, by the fifth week of school, almost eighty percent of all schedule changes for the term were processed. While it appears that there is a flurry of schedule adjustments near the beginning of the school term, with a marked decrease later on in the term, one could interpret the results somewhat differently. In a semester that lasts approximately 90 days or 15 weeks, it takes fully five weeks or a third of the term before most student schedule adjustments are made.

Figure 2. Distribution of Schedule Changes at Jefferson High School Spring 1992



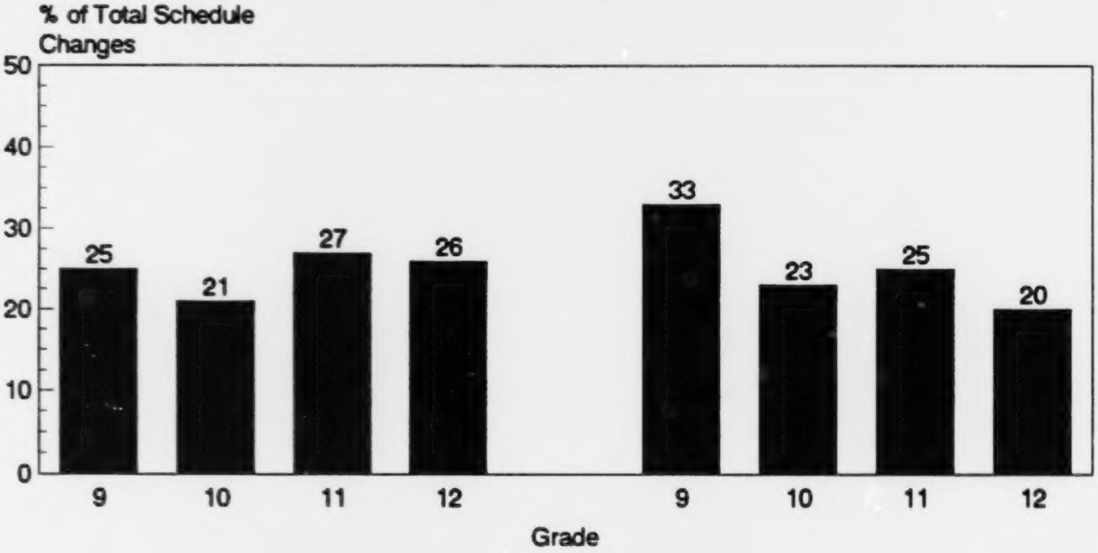
As Figure 2 shows, changes occurred somewhat more quickly during the second term as compared with the first term. Thirty-five changes were made in January and 152 during the first week of classes in the spring semester;

together, these represent twenty-three percent of the spring term schedule changes. An additional forty-one percent, or 323 changes, occurred during the second week of the semester. After the fourth week (24-Feb), the pace of schedule changes dropped off dramatically. It appears that the schedule change process occurred more efficiently during the second semester of the school year. More analyses of the data are needed to understand the reasons for this different pattern. Perhaps the kinds of schedule changes that were needed in the second semester came to the attention of staff members more quickly. Or, the arena scheduling process used for spring semester scheduling may have resulted in schedule change requests that, while not fewer in number, were at least easier to process than the changes of the fall term.

3. How were schedule changes distributed across grades?

Figure 3 shows the distribution of schedule change requests by grade level, for the fall and spring semesters at Jefferson High School.

Figure 3. Distribution of Schedule
Changes at Jefferson High School, by Gd.
Fall 1991 Spring 1992



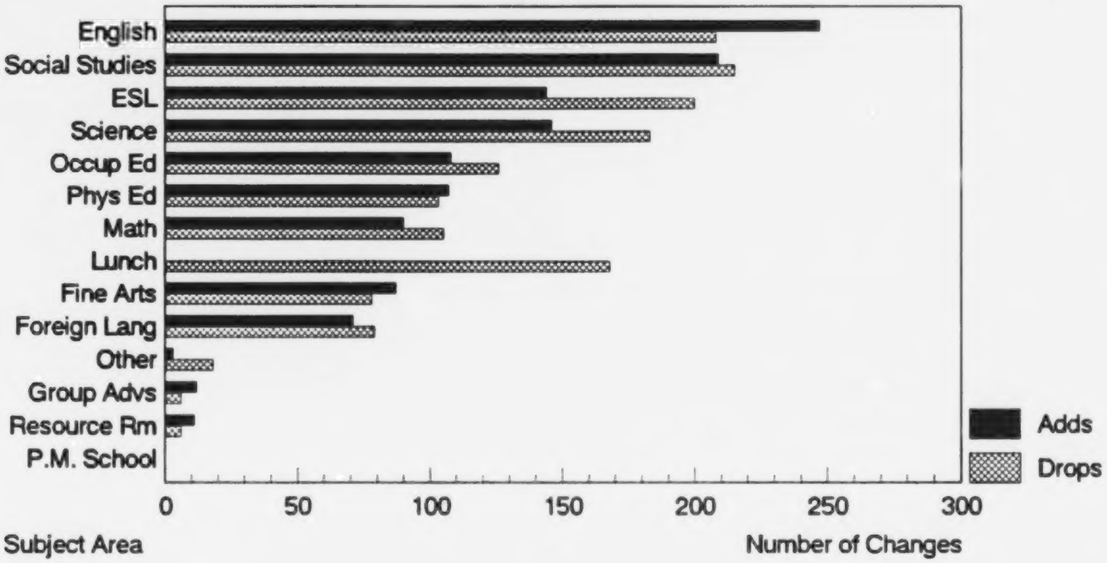
In the fall semester of 1991-92, schedule changes were fairly evenly distributed among the four grade levels. Tenth-graders had the lowest proportion of schedule adjustments, 21%. Eleventh-graders had the highest proportion of schedule changes with twenty-seven percent. In the spring semester, the distribution was somewhat more uneven. Ninth-graders had the most schedule changes, with thirty-three percent of all changes; and twelfth-graders had the fewest, with twenty percent of the changes.

One might expect the schedules of students new to the school to be most in need of adjustment. In an average high school, this would be consistent with ninth-graders having the most schedule changes. However, it should be recalled that the students who enter Jefferson High School in the fall are not necessarily ninth-graders; they are more likely to be older students from foreign countries or dropouts from other high schools than to be students coming directly from a middle school. Thus, it is not surprising that ninth-graders do not submit proportionately more schedule change requests than do students from other grade levels in the fall semester. The change requests of new students may in fact be distributed among new students in all four grade levels. It is curious, however, that ninth-graders have the most schedule changes in the spring term. Perhaps this is because they have the most options for scheduling classes and changing them, or because it is more difficult to predict whether they will pass their fall classes when the time comes to use those predictions to schedule students for spring classes. The low proportion of schedule changes in the spring for seniors is much less surprising; presumably, this is the last semester in high school for most of these students and by this time their schedules should be, one would hope, free of errors.

4. Which subject areas were involved in the schedule changes?

Figures 4 and 5 show the distribution of schedule changes among the various curricular areas for the fall and spring semesters at Jefferson High School. They are arranged by descending order of total changes (that is, the sums of adds and drops in each curricular subject). In this analysis, we have not differentiated between cases where one class is dropped and a completely different one is added and cases where a class is dropped in one period but a different section of the same course is added in a different period. In some cases, therefore, the same class might be counted as a "drop" and also as an "add." This is not unreasonable, in light of the fact that although the course has not changed, there has in fact been a change in schedule for both the student and for the teachers involved.

Figure 4. Number of Course Changes at
Jefferson High School by Subject Area
Fall 1991

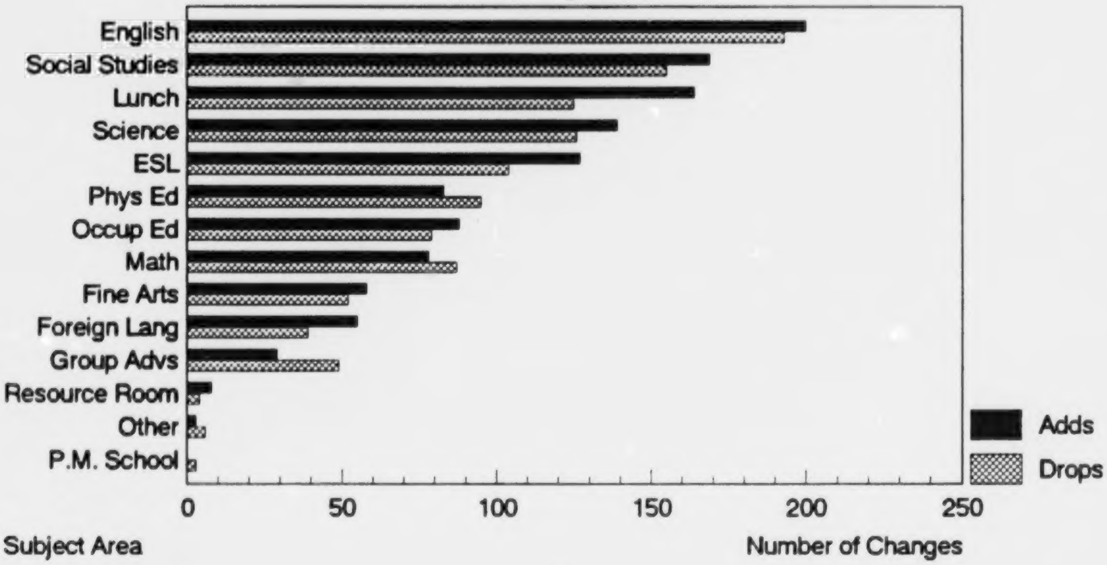


In the fall term, the greatest number of class changes (that is, the sum of drops and adds) involved the English department. A total of 455 class changes were made in English, accounting for seventeen percent of all class changes in the fall term. Social studies classes had the next highest level of changes, with 424 class changes, or sixteen percent of the total. There were also large numbers of class changes in English as a Second Language (ESL) and science classes during the fall term.

The difference between classes dropped and classes added represents the net change for a curricular area. In the fall semester, the English department saw a net increase in students taking classes. Once all schedule changes had been made, there were almost forty additional students enrolled in English classes. This number is probably not high enough to seriously affect English classes or the level of instructional staffing for them. There were also small net increases in students enrolled in fine arts classes, group advisement classes, and resource room classes. Again, these increases were probably fairly easy for the curricular areas to absorb. The greatest net decrease in student class enrollment occurred with the ESL classes. There also was a significant decrease in student enrollment in lunch. Frequently, students would have to drop lunch in order to add an additional course that they needed; science labs often necessitated this kind of change.

As Figure 5 shows, the English, social studies, ESL, and science curricular areas also had the most schedule changes in the spring semester at Jefferson High School. These four subjects represented over half of the total class changes in the spring term. Lunch periods were also dropped and added in fairly high numbers. No department had high net changes, once classes dropped and added were compared.

Figure 5. Number of Course Changes at Jefferson High School by Subject Area Spring 1992



5. What were the reasons for the schedule changes?

Students (and sometimes staff members) recorded their reasons for making schedule change requests voluntarily on the forms which they used to request changes. The standard request form listed nineteen possible reasons for the fall term and a revised set of nine reasons for the spring term; the form was designed so that students could list all reasons applicable to each class change which they requested. In the fall term, 578 reasons for change requests were given on the request forms; assuming that most requests were accompanied by just one reason for the request, this indicates that somewhat fewer than a third of the classes which were changed in the fall had a reason for the request indicated. In the spring term, 460 reasons were noted on the forms; this probably represented about a quarter of all the classes changed that semester.

Figure 6 displays the reasons for schedules changes for the fall 1991 term.

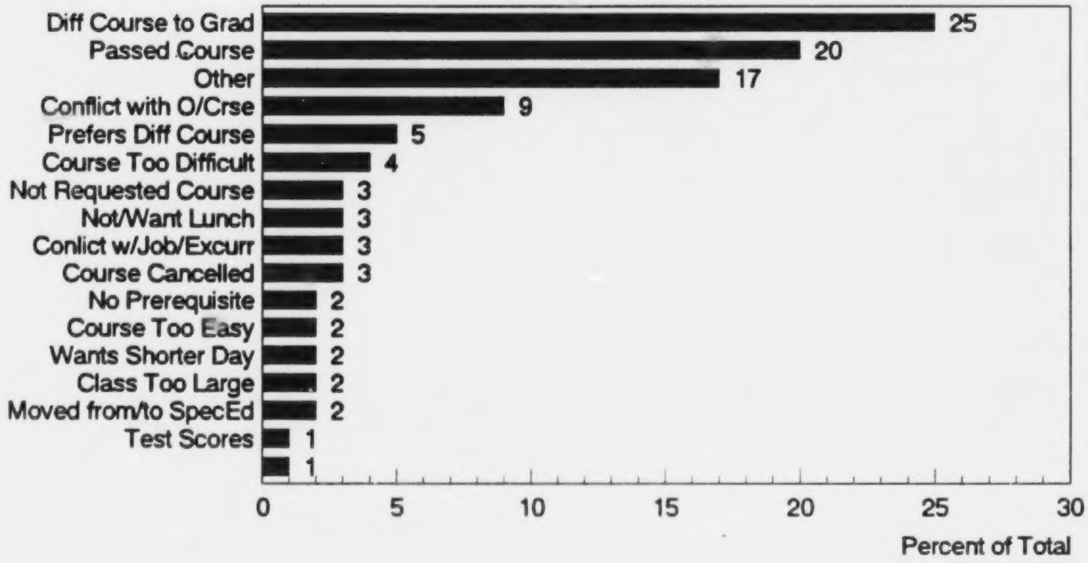
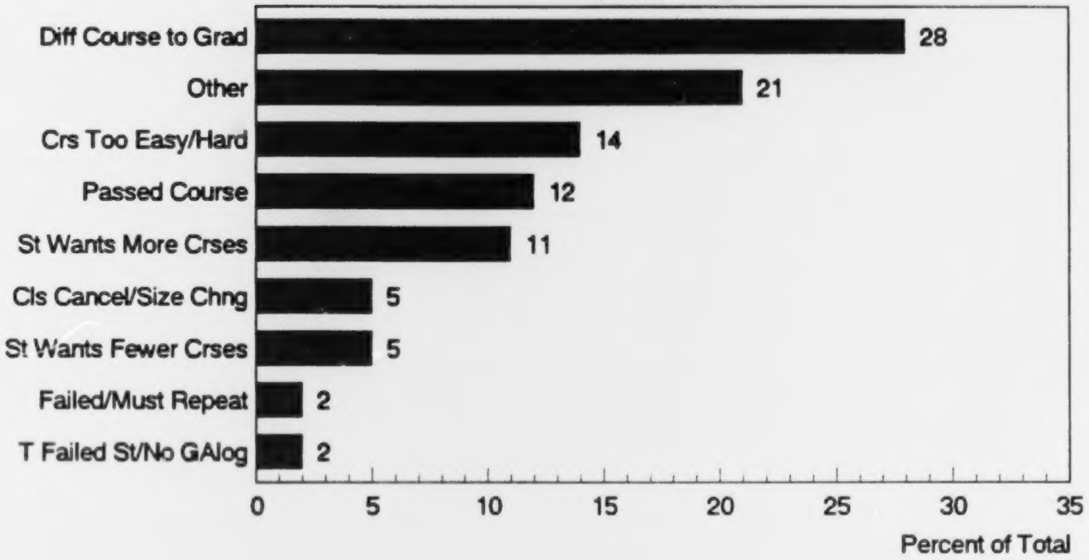


Figure 6. Distribution of Reasons for Schedule Changes at Jefferson High Schl Fall 1991

In the fall term, the most frequent reason for requesting a course change was "the student needs a different class to graduate," and the second most frequent was "the student already passed the course." Together, these two reasons were cited in forty-five percent of all of the class change requests for which reasons were given. The next most frequent reason cited was "other," indicating that none of the listed reasons was applicable in seventeen percent of the cases where a reason for the change request was given. We can only speculate as to what "other" might actually mean. One possibility is that this reason was given when there were personal, subjective reasons for wanting a class change. It was noted above that class changes were not granted at Jefferson High School simply because a student didn't get along with a teacher; indeed, there were no instances where that reason was checked on a schedule change request form. But it might have been the reason for which "other" was a proxy. In nine percent of the change requests with reasons, the reason given was "the course conflicts with another desired course." Twelve other reasons were each cited in five percent or less of the cases.

Figure 7 shows the reasons for course changes for the spring 1992 term.

Figure 7. Distribution of Reasons for
Schedule Changes at Jefferson High Schl
Spring 1992



In the spring term, the most frequent reason cited was again that the student needs a different class to graduate; this reason was given in twenty-eight percent of the change requests that had reasons. The second most frequent reason, listed in twenty-one percent of the requests with reasons, was "other." Again, we speculate that this reason may have been cited in cases where there was a personal or subjective reason for the course change. In fourteen percent of the change requests, the reason given was "the course is either too easy or too hard for the student." This reason had been cited in only six percent of the fall change requests. Twelve percent of the change requests with reasons were based on the reason that the student already passed the course. The frequency of this reason declined significantly from the fall semester, and is probably due to the fact that in the fall, many schedule changes are necessitated when the school staff become aware that students have already taken a class at another school or in summer school.

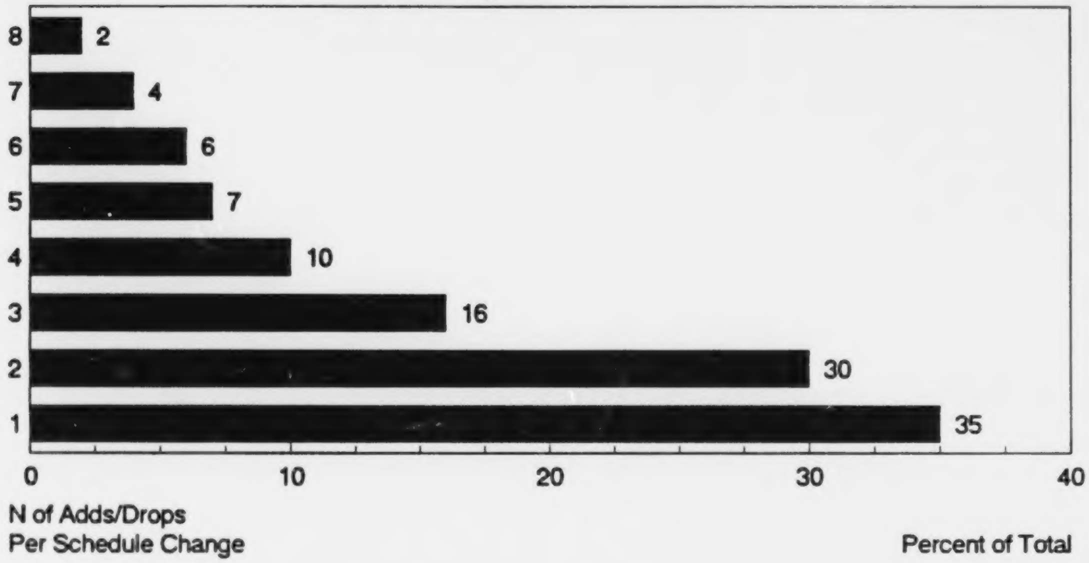
6. How intense were the schedule changes?

The majority of schedule change records for Jefferson High School students entailed a change in more than one class for the student. In the fall term, the 673 records with class changes actually represented changes in 1,865 classes; in the spring term, there were 1,748 class changes distributed across the 782 records that had changes. (In this analysis, a "change" is taken to mean any alteration in the schedule of a single period in the school day: a class may be dropped from the student's schedule, or a class may be added, or one class may be dropped and another one added in its place.)

In our analysis, student schedule changes are considered "intense" if they involve changes in relatively many class periods. Schedules in which classes are changed for just one or two periods of the school day are less intense, and involve less disruption for students, than schedules in which classes are changed in six, seven, or even eight class periods.

Figure 8 shows the proportions of schedule changes which reflected changes in one period of the school day, two periods, and so on up to eight periods, for the fall semester. Figure 9 presents the corresponding results for the spring semester. In the fall, just over a third (35%) of the schedule changes involved a change in just one class period -- either a single drop, a single add, or a single combination drop/add.

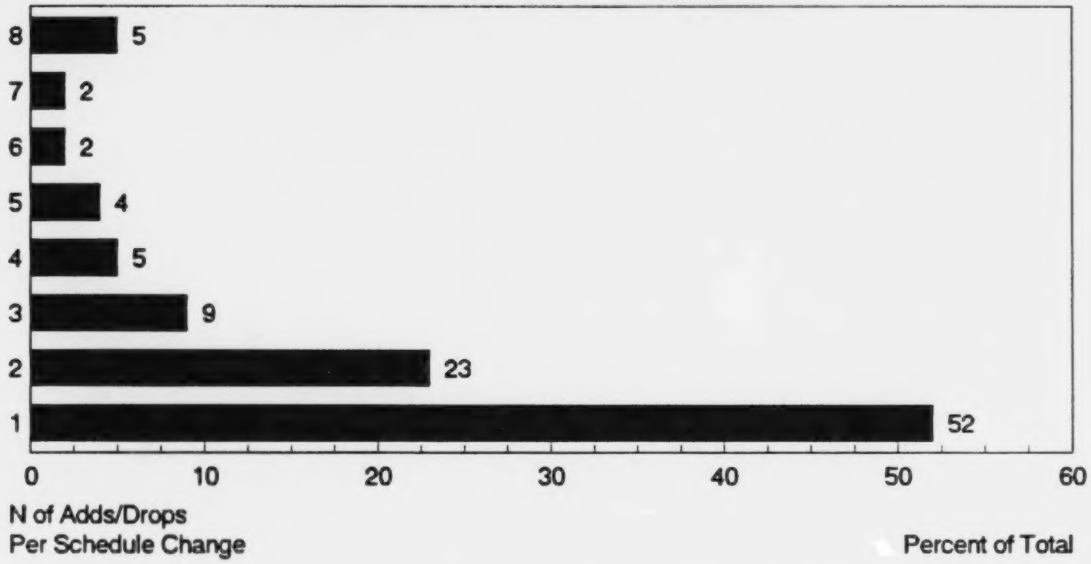
Figure 8. Distribution of the Number of Adds and Drops Per Schedule Change at Jefferson High School – Fall 1991



Another twenty percent of the changes involved just two periods of the school day. However, twenty-nine percent of the schedule changes involved changes in four or more class periods. In other words, over a quarter of the students who had their schedules changed at all at Jefferson High School had fully half or more of their class schedule altered during the fall semester. "Intense" schedule changes -- those involving changes in four or more class periods -- accounted for 1,042 class period changes, which represented fifty-six percent of all class changes during the fall term.

Spring schedule changes were far less intense. As Figure 9 shows, over half of the students with schedule changes had a change in just one class period in the spring term, and another twenty-three percent had changes in just two class periods.

Figure 9. Distribution of the Number of Adds and Drops Per Schedule Change at Jefferson High School - Spring 1992



Only eighteen percent of the students with changes had disruptions in four or more class periods, compared to twenty-nine percent in the fall term. It should be noted that this includes about thirty students who either received completely new schedules at the beginning of February or whose old schedules were unknown; these students may have been long-term truants just returning to school or perhaps new entrants to the school. Intense schedule changes accounted for 784 class period changes, representing forty-five percent of all class changes during the spring semester.

In all, there was a very slight reduction in the raw number of classes that were changed in the spring semester as compared with the fall semester. Moreover, there was a considerable reduction in the intensity of those changes; most were changes of just one or two classes in students' schedules. Nevertheless, both the total numbers of schedule changes and the intensity of changes for each semester are very large for a small school and probably represent a considerable amount of disturbance for teachers, guidance staff, administrators, and most of all students.

Discussion and Implications

As our analysis suggests, the course assignment process at Jefferson High School is far from over once students select the courses they want and receive their class schedules at the beginning of an academic term. Indeed, the vast majority of students in the school experience a change in at least one class period each term, and school staff must process a very high number of class changes. This turbulence in student enrollment in classes must be disruptive to both students and staff, even though it is so commonplace that persons we interviewed seemed almost inured to its effects. It certainly makes for a very unstable instructional environment during the first few weeks of classes, as students shift from class to class and teachers cope with ever-changing rosters of students in their classes. At the very least, this conveys a message that the early part of the semester doesn't really matter, and for some students who are already on the margins of school life, this may be enough to disengage them for the duration of the academic term.

Although our data did not include the reasons for all of the schedule changes which were requested or granted, there was one clear trend in the reasons which were available to us. It was very frequently cited that a class change was requested either because the student had already passed the course or because the student needed a different course in order to fulfill graduation requirements. The fact that these reasons were invoked so often suggests that school staff and students do not have adequate information available to them at the time that students are initially enrolled in classes, thus necessitating class changes when information does become available. It should be clear at any given time in a student's career what courses are still needed to fulfill graduation requirements. And it should be clear at some point before the beginning of a semester what courses students have taken and passed in previous semesters. At Jefferson High School, however, neither of these types of information seemed to be consistently available.

It is unlikely that the student course assignment process could ever be flawless the first time around, but it is certainly the case that changes in the way students are scheduled could reduce the magnitude of schedule adjustments. Changes in the scheduling process that might help include timing the process later in the academic terms so that more information on student performance during the current term is available, and allocating teacher and grade advisor time to reviewing student schedules prior to the start of a new term and making necessary adjustments. Instituting such changes would require significant support from school administrators, both within the school itself and at the district level.

Lincoln High School

Overview of Lincoln High School

Lincoln High School is located in one of the poorest neighborhoods in a large urban center in the Northeast. It is surrounded by three large housing projects and many abandoned buildings or frame houses in poor condition. The overwhelming majority of the 1,200 students enrolled in the school are black, and about 3% are Hispanic; there is a small influx of Haitian, Jamaican and African students each year. Student mobility is very high; the school experiences a 35-40% turnover in the student population each year. The annual dropout rate at Lincoln High School is approximately three times the state average. In 1991-92, Lincoln admitted approximately 350 new ninth graders, but had only 170 seniors. Although the high turnover rate makes comparing these figures risky, it appears as though a substantial number of those who enter do not survive to graduation.

The Curriculum at Lincoln High School

Lincoln is a comprehensive high school, and the staff describe the school's curriculum as a general academic curriculum. There are special courses for college preparatory/honors students (although not in all subject areas) and for special education students, but the staff at Lincoln do not refer to tracks. Classes in English, mathematics, social studies, and science are grouped on the basis of student test scores, however. There are three levels of classes in English, and two levels in social studies, science and math. The state requires students to take four years of English, three years each of social studies and mathematics, and one year each of fine arts and practical arts. Students need a total of 110 credits to graduate, with a five-day course equal to five credits.

English.

The standard English sequence consists of English I (introductory, basic grammar), English II (a continuation of English I, with beginning literature and the short story), English III (American literature) and English IV (British literature). In addition, the English department offers basic skills courses focusing on skills covered on the state competency test, and an elective course for preparing students for the SAT. In 1990-91, the top level of English classes, Level 1, consisted of students scoring between the 29th and 99th percentiles on standardized tests, typically the California Test of Basic Skills (CTBS). The other two levels are designated for students who have failed the state competency test. The cutoffs for Level 1 vary from one year to the next; in the 1991-92 year, Level 1 consisted of students scoring between the 49th and 99th percentiles. In both years, however, the Level 1 courses had an extremely broad range of student abilities, and the English department chair may attempt to reprogram high achievers in English II to English IV into separate sections of these courses in the middle of the first term to achieve a more homogeneous grouping.

Mathematics.

The math curriculum at Lincoln consists of General Math I and II, four college preparatory courses (Algebra I, Geometry, Algebra II, and Trigonometry), and one computer programming class (emphasizing programming in Basic). Entering ninth grade students who score below the 50th percentile on the CTBS are programmed for General Math I, while those scoring above this level are programmed for Algebra I. Occasionally there is a section of Honors Algebra. Students' performance in General Math I dictates the next course in the sequence. Those who receive an A or B in General Math I typically take Algebra I, while those who receive a C or D are programmed for General Math II. Students who fail General Math I must repeat it. Students who pass General Math II subsequently take Algebra I.

Science.

Ninth graders are programmed for science on the basis of their math and verbal test scores. Lower performers enroll in General Science, while higher performers take Introduction to Physical Science. In the tenth grade, all students take Biology, but there are two levels of the course offered. In the junior and senior years, the science curriculum consists of a college preparatory Physics course (with a lab session), and a Chemistry course offered with two levels, one college preparatory, and the other not.

Social Studies.

The courses offered by the social studies department are mainly mandated by the state. The state requires one year of World History and two years of U.S. History. World History is offered in the ninth grade, while U.S. History I is typically taken in the tenth grade and U.S. History II in the eleventh grade. Each of these courses has two levels, with assignment determined by test scores. The social studies department also offers two elective courses, African-American History and Law in Action.

Foreign Languages.

Lincoln offers French I and II and Spanish I and II, but only a small number of students enroll in foreign language classes. There is no bilingual program at Lincoln.

Special Education.

There are two groups of special education students. The first group is self-contained for core classes in English, math, science, and history. The second group is mainstreamed, taking classes with non-special education students, supplemented with resource room instruction. These students are not identified as special education students, and teachers often discover their special education status only by accident.

There is little coordination across subject areas. U.S. History II is linked with English III, so that the writing that students do in English III is tied to the content of U.S. History II.

The Scheduling and Assignment Process at Lincoln High School

Although scheduling is an ongoing process at any high school, we have divided the process into a series of relatively distinct activities or phases: building the master schedule, assigning students to courses, and making adjustments. Many high schools schedule year-long courses only; but Lincoln adopted term (i.e., half-year) scheduling for major subjects in the 1991-92 school year, which we treat in the section on making adjustments.

Building the Master Schedule

Individual teachers have little control over the master schedule, and while department chairs are responsible for submitting lists of courses, in fact they have little control as well. The master schedule at Lincoln is largely driven by state requirements, in the form of specific course mandates and the state's required proficiency test. Much of the instruction at Lincoln is designed to prepare students to pass this test.

In mid-April, department chairs submit lists of course offerings, including class size caps, to the scheduling office. Usually classes are capped at 20 to 30 students, but some classes may have lower caps, and others may have higher ones. These caps are frequently overridden later in the scheduling process. These lists are simultaneously routed to the guidance office, for use in scheduling individual students. Using worksheets with students' test scores, and occasionally with student consultation, guidance counselors "bubble in" students' course selections, based on the course offerings list. These bubble sheets are then processed by computer to produce tallies of the number of students for each class. The master schedule, with courses linked to specific instructors, rooms, and periods of the day, is then blocked out by hand.

Assigning Students to Courses

Different processes are used to assign students to courses, depending on whether a student is an entering ninth-grade student, an existing Lincoln student, or an "over-the-counter" new admission at the beginning of the school year or later.

Scheduling entering ninth grade students. Lincoln High counselors attempt to pre-schedule all of the eighth-grade students in Lincoln's cachement area, based on a district-wide address list. Junior high school counselors fill out a pre-scheduling questionnaire, but the actual placement of students in ninth-grade classes is based entirely on seventh-grade CTBS scores. Eighth-grade students take the CTBS in May, but the scores arrive at the end of June, after the initial fall scheduling is complete. However, the eighth-grade scores are cross-checked against the forms used for initial course selection, and students' course schedules are updated where appropriate during the summer. Because test scores drive ninth-grade course placement, virtually the only incoming students who have any choice in their ninth-grade programs are those who received high scores on both the verbal and math portions of the CTBS.

It is extremely difficult to predict who will actually enroll in the ninth-grade class, because students may enroll in other city high schools, and the magnet or specialty programs in some of these schools draw students away from Lincoln. Consequently, while Lincoln's guidance staff schedules *all* of the eligible eighth-grade students as if they will enroll, perhaps 70% of these will actually show up. Still others will enroll in a specialty high school, determine that the program is too difficult, and appear at Lincoln several weeks into the term.

Scheduling existing students. The scheduling of existing students is based largely on test scores and grades. At the time that existing students are scheduled, grades are available for three "cycles", or quarters, of the academic year. Guidance counselors must guess whether or not students will pass their courses based on the three cycles of information available, and schedule students accordingly. However, the results of the April state competency test are not available until June, after the initial scheduling, and many students' schedules must be revised after scores arrive. The information available at the time of scheduling includes pre-scheduling worksheets that guidance staff fill out, frequently in consultation with students, prior state competency test scores, and "Final Failure" sheets that teachers fill out before the release of the fourth cycle grades indicating who will fail the term.

Scheduling over-the-counter admissions. Lincoln admits an extraordinary number of unexpected new students during September (as well as later in the school year). Staff estimate that, for the first three weeks of September, 25 new students *per day* arrive seeking admission, many with no record of previous academic performance. The guidance office essentially grinds to a halt for the first three weeks in September, because simply processing these new students eats up all of the available time. Since placement in Lincoln's academic program is determined by test scores, such new students must be tested, typically with an older version of the CTBS or the state competency test. Guidance staff interview students, have them choose courses, and send them home until their tests can be scored and a schedule developed for each student. Over-the-counter admissions are scheduled by hand. Guidance counselors can override enrollment caps that are built into the computerized scheduling software. Such enrollment caps may not be real anyway, as classes that the computer indicates are full may be made up in part of students who will not show up at Lincoln.

Making Adjustments

Most adjustments in the schedules of individual students are deferred until after the influx of over-the-counter admissions is processed. Thus, it may not be until near the end of September that problems in students' programs are addressed. The shuffling of students that occurs late in September is very chaotic, with many students shifting courses. It is perhaps this instability that accounts for a teacher telling us, "We're instructed not to even give out textbooks until October." A more detailed analysis of the schedule change process follows, but for now, we note that schedule changes are initiated for a number of reasons, including an improper assignment (e.g., a student passed a course in summer school and was scheduled for the same course in the fall, or a student passed the state competency test in April but was scheduled for an test preparation class in the spring), a "hole" in a student's schedule, a desire to "level" or even out the enrollments in a particular class across sections, and a teacher- or student-initiated complaint about a particular placement.

The Role of Students in the Scheduling and Assignment Process

Although we did not interview students regarding their role in the scheduling and assignment process, our interviews with teachers and guidance counselors did reveal the very limited role that individual students play in this process, and the relative lack of control students exercise over their academic programs. Incoming students have virtually no say in their programs, which are driven largely by state mandates. Incoming ninth-graders are pre-scheduled by counselors at the junior high school, based on their test scores. Only high scorers have any flexibility or choices in their programs. Because course assignments are so dependent on test scores, even returning students have little influence over the courses they take, and counselors may not even meet with students before scheduling them. One guidance counselor said, "The BSI [Basic Skills Instruction] students, you don't need to see them because so much is fixed." Other counselors meet with students to review graduation requirements and discuss the few choices available. But there are so few elective courses in the school, especially for students who have not yet passed the state competency test, that such choices are largely irrelevant. Student demand has virtually no impact on the master schedule, because most departmental resources are expended on required courses, with little staff time available for electives.

Students exercise a modicum of control over their programs by trying to "beat the system". For example, students can get into any of the city's high schools by expressing an interest in a particular school's magnet program. Lincoln High, a comprehensive neighborhood school lacking distinctive specialty programs, is thus deprived of those students clever enough to go elsewhere. Students who do enroll can try to manipulate their programs by claiming in the fall that they never got a program in June, or simply by not showing up for classes they don't want, in the hopes that the teacher will drop them from the class and they will be able to add some other course.

Those students who do lobby for access to particular courses are likely to be admitted to them, but once the term starts, schedule changes are not quite as automatic. One staff member said, "You're entitled to fail any course you want," indicating that students who aspire to courses that may exceed their grasp may still be scheduled for them if they are persistent enough in their requests. A counselor commented, "If a student requests a higher-level course, I march them to the department chair and if it's okay I do it. If the student really believes they can do a higher level and there's room in the course, they'll do it."

Student complaints can trigger changes, although staff members respond in various ways to such complaints. Some of the counselors at Lincoln are reluctant to make any changes, telling students, "We're instructed not to make a schedule change unless there is an error in your program." But there is no common agreement on what constitutes a scheduling error, and some counselors are more liberal than others in interpreting this policy. One counselor said, "If they come to me and it's a valid reason, I'll make the change only up till December. But in April or May, I refuse. Realistically, not every youngster can get along with every teacher. I know some teachers are difficult."

One type of schedule change that is virtually automatic is when a student is assigned to a teacher who has previously failed him or her. But the scheduling process itself does not catch this, so such a change is dependent on a student taking the initiative to complain to his or her counselor. In this sense, vocal students at Lincoln have more control over the scheduling and assignment process than those students who remain silent.

The Role of Teachers in the Scheduling and Assignment Process

Teachers have little control over the master schedule. One told us in the spring of the year, "I have been told what I'll teach [next year], but it's not written in stone. We're asked what we'd like to teach. They try to accommodate us, but there's so many sections we have to make sure we are covered." Another teacher said, "I won't know for sure what I'm teaching until September." And when we asked Lincoln teachers "What role do you play in course scheduling/assignment?" a number replied simply, "None." The lack of electives in the school curriculum constrains teacher participation. One said, "I could develop a new course, but the odds are that between basic skills and other requirements, very few students would take it."

In fact, there are two major ways that teachers influence the scheduling and assignment process. The first is through recommendations for higher-level courses. The guidance staff and department chairs at Lincoln are constantly looking for students who are qualified for, and may benefit from, higher-level, college-preparatory courses and sections. Teacher recommendations, either through written lists, or word-of-mouth, are a major source of potential students. Not all teachers are in a position to make such recommendations, however. The courses that a teacher instructs may place limits on his or her ability to make recommendations for higher-level courses. One teacher said, "We sometimes have an opportunity to recommend students for high-level courses, but I have mid-level classes and I don't have any students to recommend." Another responded, "I didn't recommend any students for [an advanced science course] this year -- I didn't feel I had any qualified students." Such recommendations are made prior to the initial scheduling decisions, and because teachers at Lincoln typically are unaware of the courses in which their students are scheduled for the following year, they are not in a position to intervene to ensure that their talented students actually wind up in higher-level courses. In fact, the recommendations frequently are not acted upon, due to conflicts in students' schedules.

The second way in which teachers influence scheduling and assignment processes is by recommending mid-year transfers of students from their own courses. In some departments, teachers bring a list of names of students who should be reassigned to other classes to their department chair mid-way through the first marking period. But individual teachers often are reluctant to recommend such changes, even when they feel that a substantial number of students don't belong in a particular class. One teacher said, "I haven't asked for any students to be moved from my classes. We're asked to try to help the students do well [not get rid of them]." But severe educational or emotional problems are dealt with promptly, not so much for their impact on the class as a whole, but for the sake of the individual child. A teacher said, "I only intervene if it's a severe problem, for example I saw a student who was copying things off the board backwards. In such a case, you're obligated to do something." But another said, "Other than [obvious or severe problems], the students are expected to just hang in there, catch up, do the best they can in their classes," a philosophy that apparently holds for the teachers as well.

Teacher-initiated schedule switches are most likely to occur if they can be handled within the department, without going through the guidance office. Department chairs at Lincoln have the authority to make such changes, and simply notify guidance of the scheduling changes.

The Role of Counselors and Administrators in the Scheduling and Assignment Process

Department chairs and guidance counselors exercise the most influence in the scheduling and assignment process at Lincoln High School. As described earlier, the department chairs submit course offering lists to the scheduling office and to the guidance office, and the guidance staff then schedule individual students. Thus, department chairs are largely responsible for building the school's master schedule. While the principal looks over this schedule, and occasionally makes recommendations, the primary concern is with ensuring that courses that students need for graduation and those required by district or state policy are offered. The department chairs also work with class lists indicating mid-term failures, and reschedule students as necessary. Under the term-scheduling system in place in 1990-92, they also reconfigured the core courses in January, to accommodate those students who failed the first term of what previously was a year-long course.

Counselors exercise wide discretion in the scheduling of individual students, and in making adjustments to students' schedules. Virtually all schedule changes are funnelled either through the guidance office or through a department chair. Counselors occasionally will rely on teacher judgments in scheduling students, but since Lincoln serves so many low-achieving students who have no electives in their programs, teacher recommendations do not often come into play. One counselor commented, "I don't solicit [recommendations] from teachers but I accept them."

Guidance counselors at Lincoln are responsible for making adjustments in students' fall schedules. Some students who were scheduled for state competency test preparation classes actually passed the test in June, and so need to be rescheduled. Others passed summer school courses, or even passed courses in the preceding academic year that they were expected to fail. Unfortunately, counselors only report one day before the students arrive in the fall, and handling the over-the-counter admissions (including processing, testing, and scheduling students) takes up much of September. Some changes that could have been made the first day of school, therefore, must wait, and students occasionally sit in a course they have already passed for a month or more. Counselors also will attempt to level class sizes and fill holes in students' schedules during the early part of the school year.

The Analysis of Schedule Changes at Lincoln High School

There are two sources of information on schedule changes at Lincoln. One is the school's own schedule change form, a brief, half-page form that simply shows the student's name and ID number, grade and homeroom, the courses that were added and/or dropped, and the date of the change, with little supporting information, such as reasons for the change in schedule. This was the primary source of information on schedule changes in both the fall and spring terms.

In addition, the project staff prepared forms designed to provide additional information on schedule change requests. In the fall term, the form had checklists to indicate who initiated the request for a schedule change, possible reasons for the schedule change request, and whether the change was granted, denied, or deferred. Project staff collected the forms that were completed, but it was apparent that these represented a small sample of the actual schedule changes. Many of these forms showed reasons for a course change, but were not always clear on the course changes themselves. The Lincoln forms were checked against the project forms, and when a match was found, the reasons listed on the project forms were entered with the course changes noted on the Lincoln forms. Thus, for a fraction of the schedule changes in the fall term, information on reasons for schedule change requests is matched with the actual course changes processed. The data file constructed from these two sources of information totaled 619 separate schedule changes for the fall, 1991 term. While some students were responsible for multiple schedule changes within the fall term, the sheer volume of schedule changes, juxtaposed with the official register count of 1,180 students, indicated that nearly one-half of the students on register in fall, 1991 had a schedule change during the fall, 1991 term.

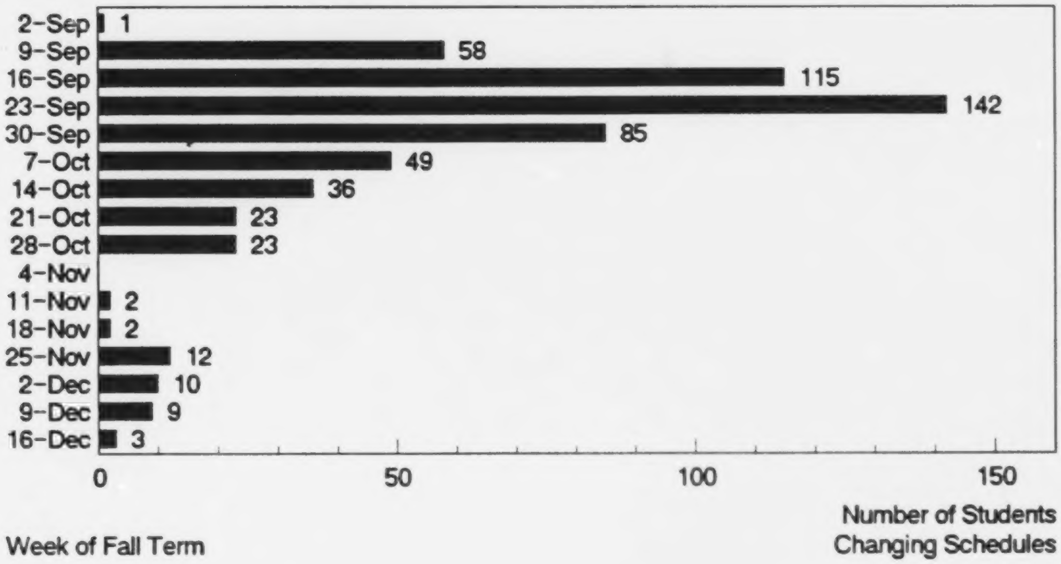
In the spring term, project staff provided Lincoln with a revised schedule change form in triplicate, which eliminated the need to photocopy the form to send to teachers and the person responsible for programming any schedule changes in Lincoln's computer system. The spring form included a streamlined list of possible reasons for course changes, and eliminated the information on who initiated the schedule change request. Lincoln staff completed a substantial number of these forms, although some schedule changes also were recorded on Lincoln's short form. The resulting dataset consists of 542 separate schedule changes for the spring, 1992 term.

In the next section, we analyze some of the data gathered in the 1991-92 academic year on schedule changes at Lincoln High School. The analysis is necessarily preliminary and provisional, as the complexities of the data are still emerging. Nevertheless, there are some fundamental features of the data that may be considered. In particular, we examine (1) when in the term schedule changes were likely to occur; (2) the grade level of students whose schedules were changed; (3) which subject areas were involved in the schedule changes; (4) the expressed reasons for the schedule changes; and (5) the intensity of the schedule change, as indicated by the total number of courses that were added and/or dropped.

1. When did schedule changes take place at Lincoln High School?

For fall, 1991, we divided the term into 16 weeks, beginning with Labor Day, Monday, September 2nd, and ending with the week of December 16th. We then examined the distribution of schedule changes across this 16-week period. Figure 10 shows the number of students changing their schedules during each of these 16 weeks in the fall, 1991 term.

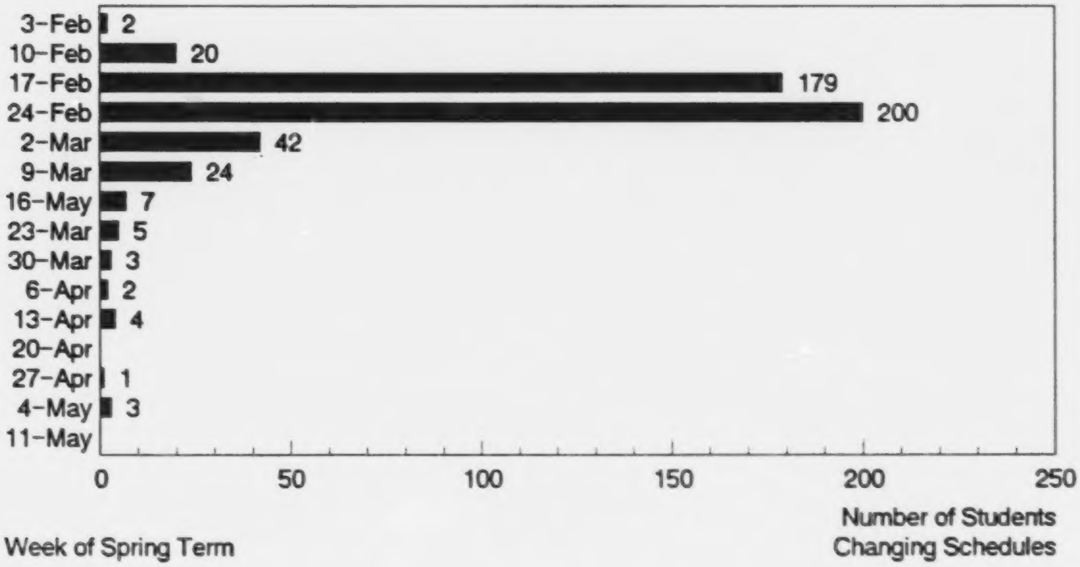
Figure 10. Distribution of Schedule Changes at Lincoln High School Fall 1991



There were virtually no schedule changes recorded in the first week of September, and only about 10% of the total occurred in the second week. Most of the schedule change activity took place in the third, fourth and fifth weeks of the term. By the end of the fifth week, 70% of all of the schedule changes recorded in fall, 1991 at Lincoln had taken place. Put differently, however, approximately 170 schedule changes -- 30% of the total -- took place *after* the fifth week of the term. Most of these occurred between the fifth week and the ninth weeks of the term, as only about 7% of the total volume of changes happened after the ninth week of the term.

Similarly, we divided the spring, 1992 term into 15 weeks, beginning with Monday, February 3rd, and ending with the week of May 11th. The distribution of schedule changes during this period is displayed in Figure 11.

Figure 11. Distribution of Schedule Changes at Lincoln High School Spring 1992



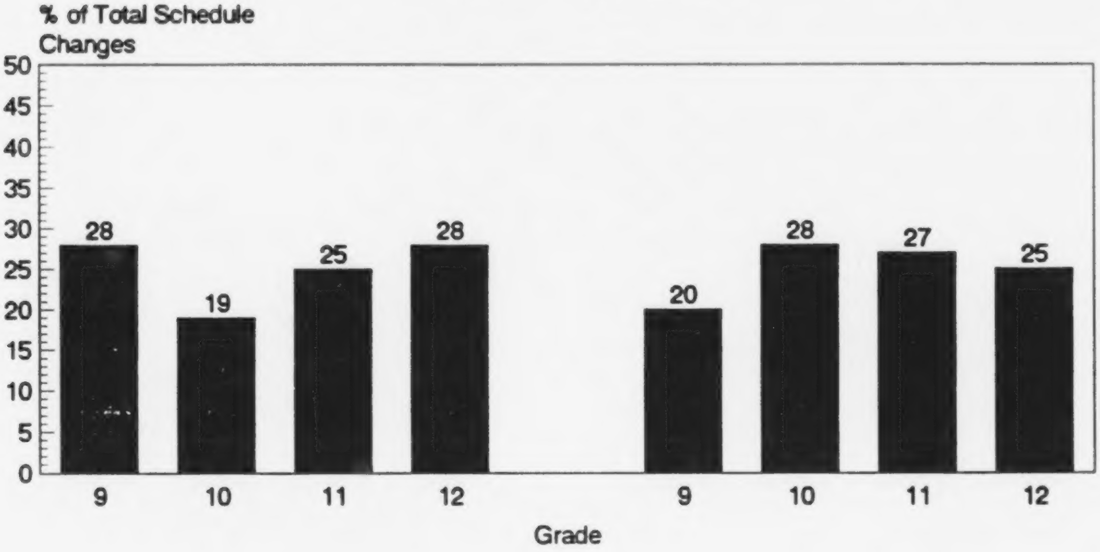
In the spring term, the schedule changes are concentrated in the third and fourth weeks of the term, as more than three-quarters of all spring schedule changes took place during this two-week period. Overall, the changes are much more "bunched" in the spring than in the fall, with relatively few changes occurring after the sixth week of the term. Whereas only 70% of the total fall schedule changes had taken place by the end of the fifth week of the fall term, 90% of the total spring changes had occurred by the end of the fifth week of the spring term.

While Lincoln High School traditionally has used year-long scheduling, in the 1991-92 academic year the school experimented with term-long courses in the major subject areas. It is likely, therefore, that a substantial number of spring schedule changes are due to students who were scheduled in the spring for the second term of a year-long sequence but failed the first term and had to repeat it. Such changes should be identified fairly early in the spring term, which may account for why schedule changes occurred earlier in the spring term than in the fall term.

2. How were schedule changes distributed across grades?

We examined the distribution of schedule changes by students' grade of enrollment, based on the schedule change forms. Both the fall and spring term distributions are shown in Figure 12.

Figure 12. Distribution of Schedule Changes at Lincoln High School, by Grade
Fall 1991 Spring 1992



The differences across grade levels are not striking. In the fall term, slightly more than half of all schedule changes involved ninth- and twelfth-graders, and tenth-graders appear slightly underrepresented. In the spring term, however, tenth- and eleventh-graders contribute more than half of the schedule changes, and ninth-graders are slightly underrepresented. In fact, there were more spring schedule changes for tenth graders than fall changes. For the other three grade levels, there were more fall changes than spring changes. This is especially true for ninth graders, who had 70% more schedule changes in the fall than in the spring.

It is difficult to interpret the grade-level patterns without more information about the reasons for the schedule changes. There are probably differing explanations for the higher numbers of fall schedule changes recorded by ninth graders and twelfth graders. Among twelfth graders, it may be that schedules are being adjusted to ensure that students have an opportunity to meet high school graduation requirements. This is less likely to be an issue among ninth graders, who have just entered high school. It may be that the high number of schedule changes among ninth graders in the fall of 1991 was due to a "shakedown" period as students adapted to educational and career aspirations, and to choose a high school program consistent with those aspirations.

3. Which subject areas were involved in the schedule changes?

There are numerous types of schedule changes. Perhaps the simplest involves dropping a course in a given period and adding another (or, perhaps, even the same course but a different section) in the same period. But the constraints of scheduling do not always allow for this kind of simple substitution. Perhaps the course that is desired to be added is not offered during the period in which a course is being dropped, but is offered during some other period. For example, suppose that a counselor and student agree to drop Algebra II, in which the student is enrolled during third period, in order to add General Math II, which is only offered during second period. One possible solution to this add/drop transaction is to examine the course in which the student is enrolled in second period, and, if possible, exchange that section for a section offered during third period. If, for example, the student were enrolled in Physical Education I during second period, and another section of Physical Education I were offered during third period, the schedule change could consist of dropping Physical Education I and adding General Math II during second period, and dropping Algebra II and adding Physical Education I during third period. Because not all classes are offered during every period of the school day (in fact, many are "singletons" or "doubletons" with only one or two sections), this kind of juggling is often used to enable a student to make the desired add/drop transaction. In some cases, it may be necessary to change five or even six periods of the schedule to engineer a specific desired change.

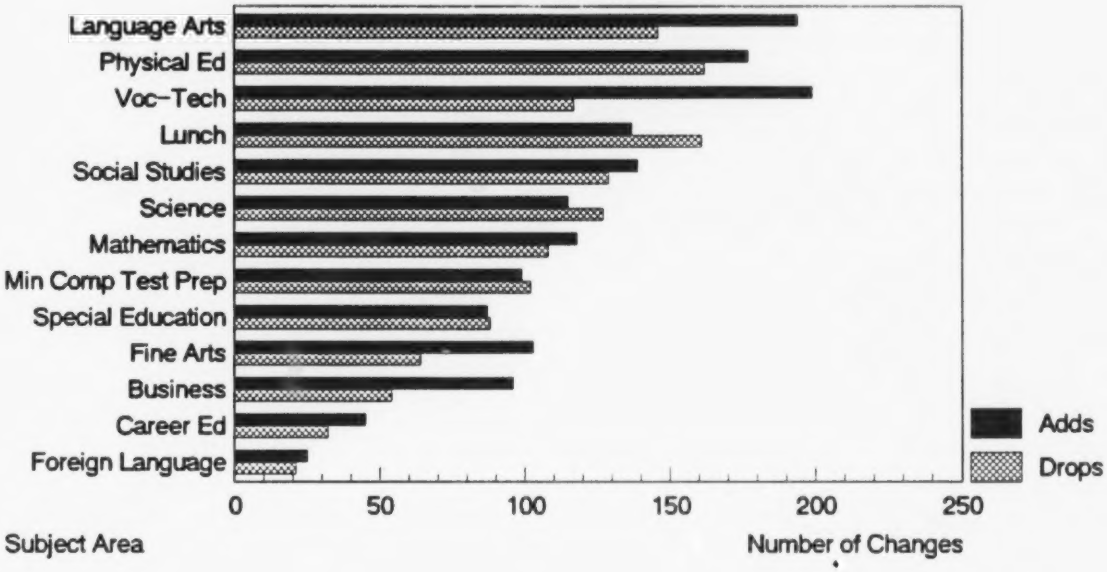
While the shift described above can help counselors and students maneuver within a constrained master schedule of courses, there are costs involved in making such moves, because students are obliged to change sections of courses they have no intention of adding or dropping in order to achieve a desired add/drop. The example discussed above is probably benign, because there is little reason to expect any particular educational consequences from moving from one physical education class to another. But the consequences are less certain for section changes involving academic subjects, where the new section presents a different academic and social environment to a student, and where the content or pacing of the instruction may differ from the previous section. This problem is probably particularly severe when the section shifts occur beyond the first few weeks of the term.

Because so many course changes are due to the kind of juggling described above, it is difficult to tell whether a course change is a "real" change or simply one enacted to enable some other change to occur. Only a fine-grained analysis of individual student programs can reveal the nature of these changes. Still, even changes that occur to facilitate other changes may have real consequences for continuity and integration in students' academic programs, as noted above. Thus, it is worth examining *all* of the course changes that occur.

We categorized course changes according to the subject area of the courses involved. Courses were grouped into thirteen categories, representing different subject matter areas. These included language arts, mathematics, science, social studies, foreign languages, fine arts, business, vocational/technical, physical education, and special education. We also isolated courses designed to prepare students for the state-mandated proficiency test, and a course in career education. Finally, we tabulated schedule changes involving lunch, which is offered during periods 4, 5, 6, and 7 of the 8-period day at Lincoln.

Figure 13 displays the number of course changes in different subject areas during the fall, 1991 term at Lincoln High.

Figure 13. Number of Course Changes at
Lincoln High School by Subject Area
Fall 1991



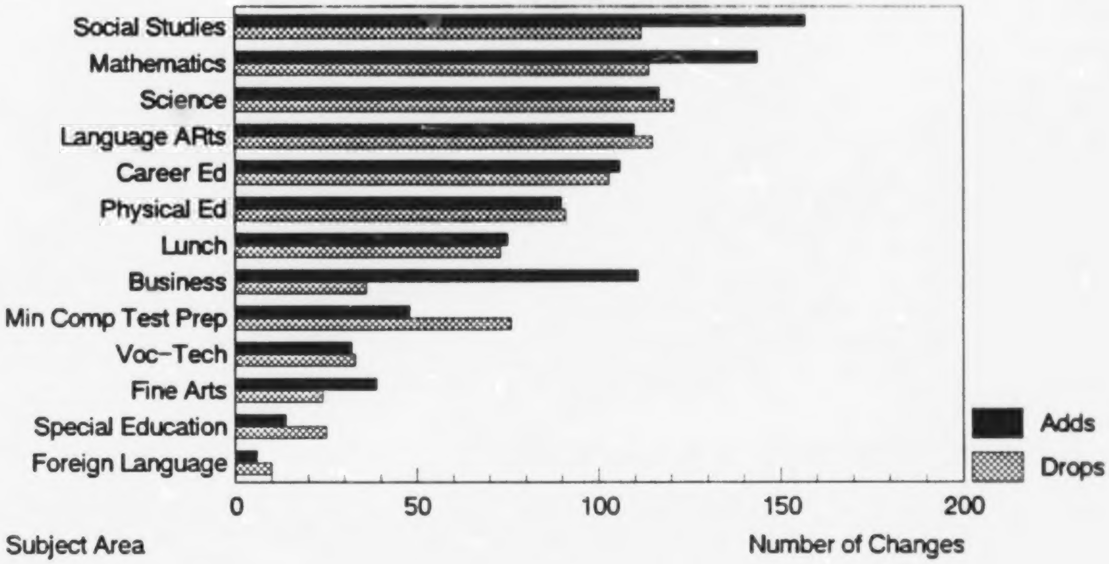
The figure shows the number of adds and drops in a given subject area, with the darker bar representing drops, and the lighter bar representing adds. The subject areas are arranged from top to bottom in decreasing order of occurrence. That is, the total number of combined adds and drops in a subject was for language arts, and the smallest number of combined adds and drops was in foreign language. By examining the gap between the number of adds and the number of drops within a given subject, it is possible to determine whether coursetaking increased or decreased in a given subject area as a result of the course schedule changes. For example, Figure 13 indicates that, of the 619 schedule changes recorded in fall, 1991, nearly 200 involved adding a language arts course, and almost 150 involved dropping a language arts course. In the case of language arts, then, the fall schedule changes resulted in a net increase in the representation of students in language arts courses. Other areas that showed notable increases included vocational/technical courses, fine arts, and business courses.

Of course, this analysis does not examine the levels of these courses, and even in subject areas where the total number of adds is nearly equal to the total number of drops, it is not possible to determine from these figures whether the schedule changes resulted in coursetaking of higher, lower, or equal difficulty. Examining the impact of schedule changes on the difficulty level of students' courses is a high priority for future research.

It may seem odd that lunch is so prominent in students' schedule changes, but the pattern is readily interpretable. Because lunch is offered in periods 4, 5, 6, and 7, it is often used to engineer schedule changes, much as study halls are in high schools that use them to fill up holes in students' schedules. This also probably accounts for why physical education courses are added and dropped so frequently, because there are few prerequisites and they are offered throughout the school day.

During the spring term, the overall volume of schedule changes is slightly lower, and there is some shifting of the rank-ordering of subject areas. Figure 14 shows the distribution of course changes at Lincoln High during the spring, 1992 term, for the 13 subject areas described earlier.

Figure 14. Number of Course Changes at Lincoln High School by Subject Area Spring 1992



While there are fewer schedule changes in the spring in language arts, physical education, vocational/technical courses, special education, and the fine arts than there were in the fall, there are more changes in the spring in social studies, mathematics, and career education. In the spring term, the pattern of adds and drops indicates a net increase in coursetaking in social studies, mathematics, and business, and a net decrease in state competency test preparation.

Perhaps the most intriguing pattern is for career education, a single course that accounted for 45 adds in Fall, 1991 and 106 adds in Spring, 1992. It is curious that there might be more activity in adds and drops in a single course than in some entire departments. Perhaps the explanation is tied to the frequency with which the course is offered during the day, but a more detailed examination is called for.

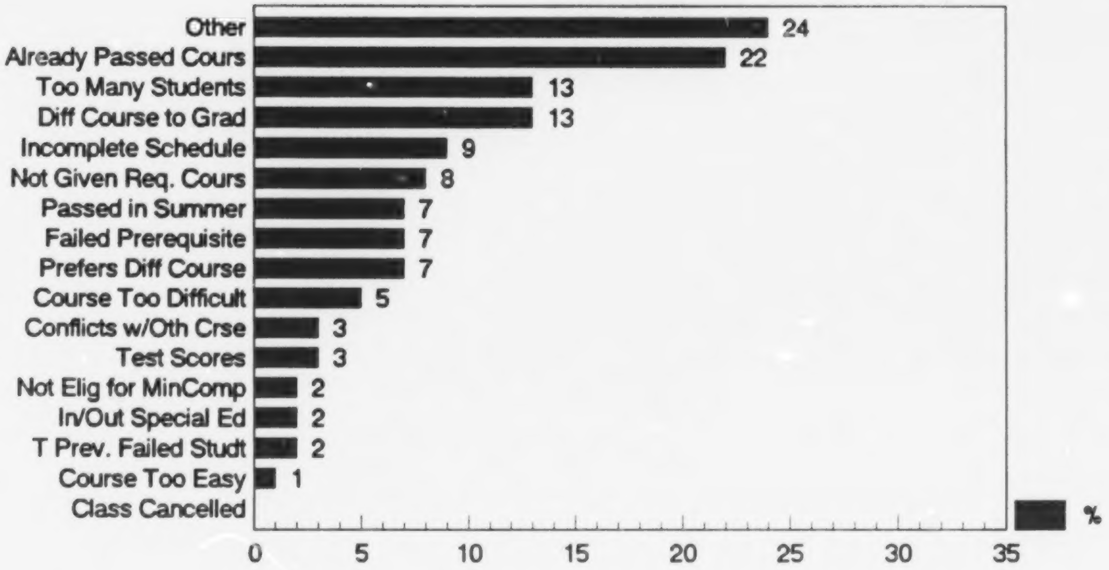
4. *What were the reasons for the schedule changes?*

Our information on the expressed reasons for schedule changes is limited. As noted earlier, some changes were recorded on forms that did not ask the Lincoln staff to note the reasons for the changes. In still other cases, even those staff members who used the forms we provided did not always indicate a reason for the course changes they recommended. Thus, we only have reasons for schedule changes for approximately one-third of the fall schedule changes. The situation for the spring term is much better, with reasons recorded for approximately 90% of the total number of schedule changes tabulated.

In the fall term, the project schedule change form listed a total of 17 different reasons for schedule change requests, and asked the staff member completing the form to check all that applied. In about one-quarter of the cases with at least one reason indicated, a second was also recorded. Since in both the fall and spring terms we asked staff to check all of the reasons that apply, the percentages for each individual reason may sum to more than 100%.

Figure 15 displays the distribution of reasons for schedule changes reported for the fall, 1991 term at Lincoln High School.

Figure 15 – Distribution of Reasons for Schedule Changes at Lincoln High School Fall 1991



The reasons are arrayed in decreasing frequency, with "other" being the most common reason given, and "class was cancelled", which no one checked, the least common reason. While the "other" category had a write-in blank for the staff member to indicate the reason, in most cases, staff simply checked "other" without actually writing in a reason for the schedule change. The category itself is thus uninformative, but it is intriguing that, with 16 additional categories available, that some combination of other reasons would prove to be the most common response.

Some of the reasons can be classified as scheduling "errors", in the sense that students were scheduled for classes that they were not eligible for, or were not scheduled for courses they were required to take. For example, in 22% of the cases where a reason was given for a schedule change, the student had already passed a course for which s/he was scheduled, and in an additional 7%, the course was passed in summer school. In other cases, students were no longer eligible for basic skills classes, presumably because they had passed the test in the appropriate area. In 7% of the cases, the student had failed a prerequisite course, and was thus ineligible for a course for which s/he was scheduled. Occasionally a student's test scores required a different course level, or a mandated basic skills class. About one out of every eight changes recorded in the fall was due to the need to change a student's schedule to enroll him/her in a different course needed for graduation.

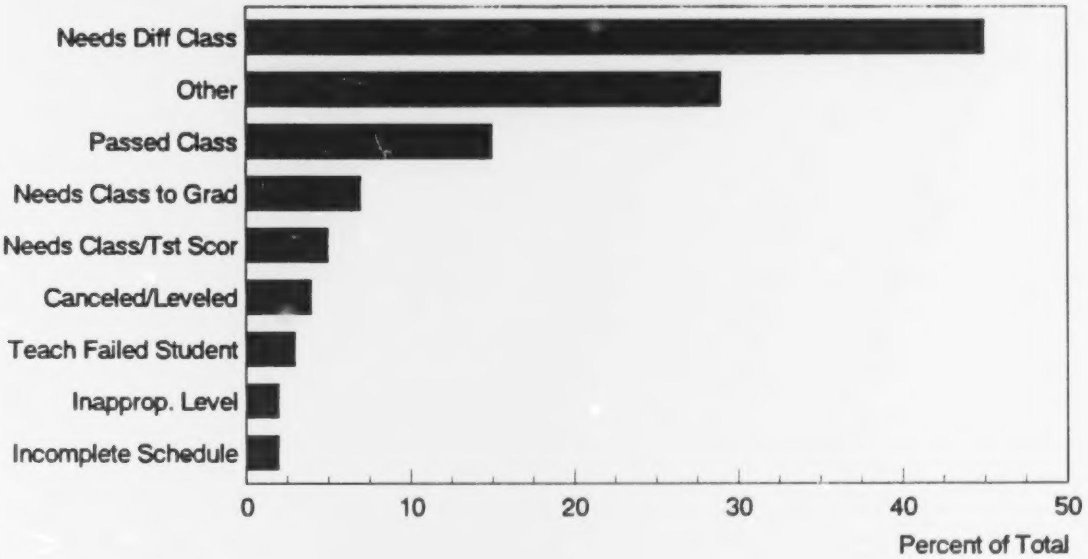
We refer to these kinds of scheduling problems as "failures", although our intent is not to blame the Lincoln High School staff for the situation. Each of these kinds of programming errors is due to a lack of good information on students -- their course performance, their test scores, and their academic programs -- at the time the scheduling for the fall term was done. In some cases, this information simply is not available at the time of scheduling, while in others, it simply is not used. Under the scheduling system currently in place, the staff responsible for constructing student schedules at Lincoln must make guesses about how students are likely to perform between the time the scheduling is actually carried out and the beginning of the fall term, and sometimes, as is inevitable, they guess incorrectly.

Direct resource constraints were not an especially prominent explanation for schedule changes at Lincoln High in fall, 1991. In 13% of the cases, students were rescheduled because one of their classes had too many students in it. But no students were reported to need rescheduling because one of their courses was canceled. It seems unlikely that no courses at Lincoln were canceled in the fall, 1991 term, and it may be that any necessary rescheduling due to course cancellation took place without the use of the project forms.

The remaining categories all received relatively little attention from the Lincoln staff. Consistent with our interviews, student preferences were not a major source of schedule changes, as only a small minority of instances involved situations where a student preferred a different class, or where courses were too hard or too easy.

The pattern observed in the spring term was generally consistent with what we have described for the fall term. Figure 16 shows the distribution of reasons for schedule changes at Lincoln high for the spring, 1992 term.

Figure 16. Distribution of Reasons for Schedule Changes at Lincoln High School Spring 1992



The schedule change form listed nine possible reasons for schedule changes, including "other". Once again, the "other" category generated an appreciable volume of responses, approaching one-third of all the cases involving a schedule change. As before, we are unable to attach a particular substantive significance to this category.

The dominant feature of Figure 16 is the fact that nearly one-half of all schedule changes in spring, 1992 at Lincoln High were due to students needing a different class on the basis of the fall term's grades. Because Lincoln had provisionally adopted term scheduling for major subjects in the 1991-92 school year, students typically were scheduled for the first term of, say, English III in the fall, and the second term of English III in the spring. But if a student failed the first term of English III, that student would be obliged to repeat that term in the spring, rather than continue with the second term of English III. A substantial share of the spring schedule changes appear to be due to students failing the fall term of a two-term sequence in major subject areas. Recall that, in Figure 14, the four subject areas with the greatest volume of schedule changes in spring, 1992 were social studies, mathematics, science, and language arts.

While this, too, is a scheduling "failure" of the sort described above, it is hard to know how to counter it without scheduling students more frequently during the school year. It is one thing to expect that a certain fraction of the students in a course are destined to fail, and will need to repeat the course; it is another to build such an expectation into a student's schedule. Creative solutions to this problem are needed.

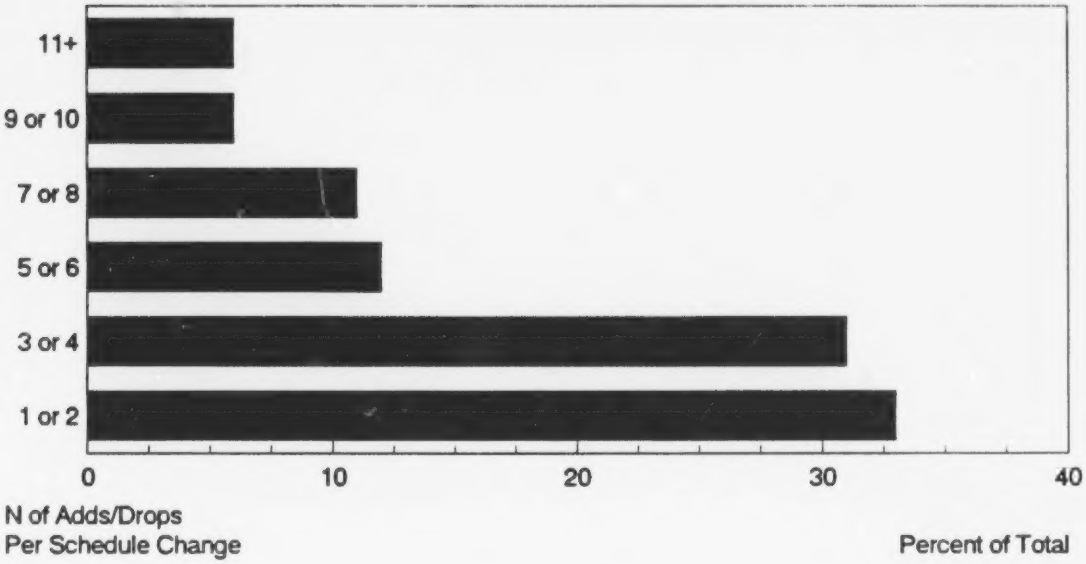
As in the fall, a sizeable number of schedule changes were due to the fact that a student had already passed a class for which s/he was scheduled. Relatively few schedule changes occurred because students needed a different class to meet graduation requirements, or because their test scores mandated a different course placement. Since non-major subjects continued to be year-long courses, once the fall "bugs" were worked out, there probably were fewer hitches with regard to spring schedules.

5. *How "intense" were the schedule changes?*

We define the intensity of a schedule change by the number of adds and/or drops involved. Simply adding a course to fill up an incomplete program is a less intense schedule change than dropping five classes and adding five others. We counted the total number of adds and drops involved in a given schedule change, and tabulated the distribution. Adding a single course, or dropping a single course, or adding one and dropping another represent 1 or 2 adds/drops per schedule change. In addition to this category, we also counted the number of changes involving 3 or 4 adds/drops, 5 or 6 adds/drops, 7 or 8 adds/drops, 9 or 10 adds/drops, and 11 or more adds/drops. With an eight-period day, the maximum possible number of adds/drops in a single transaction is 16, but no case in our sample involved quite that many.

Figure 17 shows the distribution of the number of adds and drops per schedule change at Lincoln High in the fall of 1991.

Figure 17. Distribution of the Number of Adds and Drops Per Schedule Change at Lincoln High School – Fall 1991



About one-third fall in the simplest category, where a single course is added, dropped, or switched.[1] Most of these involve one add coupled with one drop. In two-thirds of the fall schedule changes, then, the change involved revisions to at least two of the eight periods in the Lincoln school day. One-half of these were due to transactions involving a total of three or four adds and drops -- the equivalent of adding two courses, and dropping two others. But a sizeable number of the fall schedule changes represent more intense changes affecting three, four, or five classes. More than 20% of all of the schedule changes at Lincoln in fall, 1991 affected four or more periods in the eight-period day. Such schedule changes may have considerable influence on students' academic experiences, especially when they occur beyond the first two weeks of the school year. It is worth exploring how to study the ways in which students experience this kind of disruption to their high school schedule.

Spring schedule changes were less intense than fall changes. Figure 18 shows the distribution of the intensity of schedule changes at Lincoln High in the spring of 1992.

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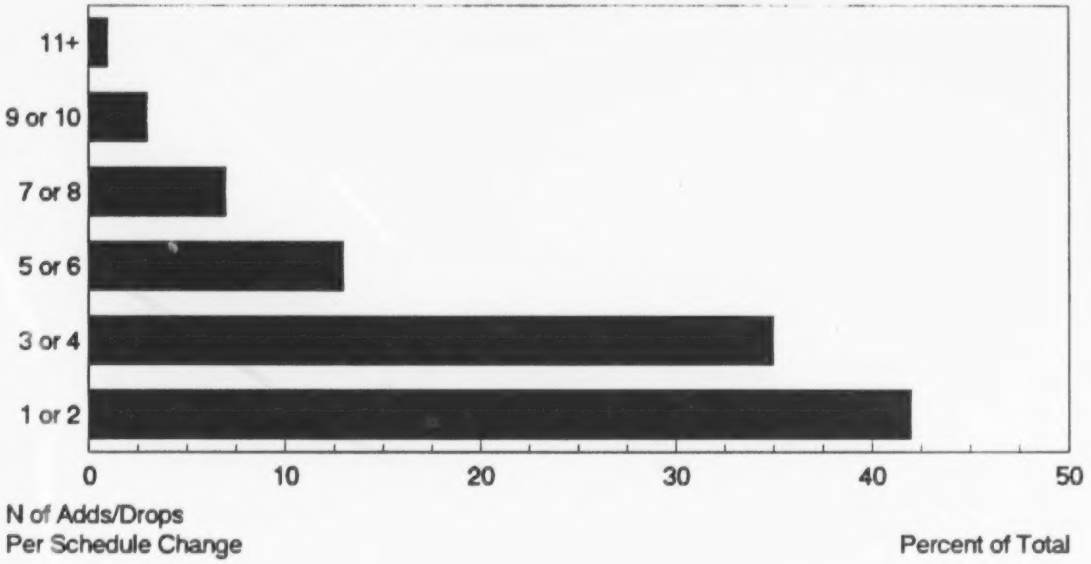
[1] In a tiny minority of cases, students in this category added two classes or dropped two classes.

Figure 18. Distribution of Number of Add and Drops Per Schedule Change at Lincoln High School - Spring 1992



While 23% of the schedule changes in fall, 1991 involved 7 or more adds/drops, only 11% of the spring, 1992 changes did so. The spring changes also were more likely to concern changes in a single period of the day. This is not surprising, in light of the finding that many of the spring schedule changes were due to students having failed a class they were projected to pass. The staff responsible for building the master schedule at Lincoln anticipated that some students would fail the first term of the two-term major subject sequences, and they attempted to schedule spring sections of these first-term courses during the same periods as the second-term classes. Thus, if a student unexpectedly failed the first term of a two-term sequence, s/he could drop the second-term class, and retake the first-term class offered during the same period as the second-term class, thereby minimizing disruption to the student's program.

Discussion and Implications

It seems unlikely that dramatic improvements in the scheduling and assignment process at Lincoln High School can be made without the cooperation and support of the district and state in which it is located. Several of the problems we have identified -- the lack of timely test scores for placing students in courses, the inability of guidance staff to change schedules in line with summer school or unexpected spring term performance, and the inability of the school staff to predict who will actually enroll -- are not resolvable at the school level. Rather, they reflect particular district, and perhaps state, policies regarding the dates of test administration, when school staff report to the building, and when students must be given a program. These dates may be the results of complex negotiations and contractual agreements, at least with regard to staff reporting dates. Still, the implications of these dates probably have not been completely understood.

We have documented, for example, that Lincoln High guidance staff must use seventh grade test scores to program incoming ninth grade students, because the eighth grade test is given late in the school year, and the scores are not available until summer, when the first round of scheduling is already complete. Similarly, initial scheduling decisions for returning students must be made prior to the receipt of spring state competency test scores, because the state competency test is administered in late spring. The failure to synchronize the testing process with the scheduling process thus leads to a considerable number of scheduling "errors" that could be averted.

We also have observed that many fall schedule changes result from schedules that did not take account of summer school courses in which students enrolled, or from an erroneous prediction about whether or not students would pass their spring classes. These, too, are scheduling "errors", in the sense that students were scheduled for classes they should not have been, based on their actual previous performance. Even worse, because the guidance staff are swamped with over-the-counter admissions in the fall, they often are unable to act on such schedule changes until late September or even early October. As a consequence, students may sit in classes they have already passed or classes that are too challenging for a month or more.

In addition, we were struck by the needless expenditure of a great deal of energy on the part of the Lincoln staff to prepare ninth-grade schedules for a large number of eighth-grade students who will never enter the school. While the staff may be able to gauge the proportion of eligible eighth-graders who will not enter, and adjust the master schedule accordingly, the fact is that a great many individual programs are wasted, and this does disrupt the master schedule substantially, by making classes that may only be half-full in the fall appear to the computer to be completely full at the time when individual schedules are prepared.

A great many of the difficulties we have described are accounted for by two factors: the district's requirement that students be provided with a schedule for the following year by the end of the school year, and the substantial overlap between scheduling and the start of classes in the fall. If Lincoln were not obliged to provide students with schedules by the end of the school year, the bulk of the scheduling could be carried out in the late summer, when test scores, final school year grades and summer school performance are all available to use in the scheduling process. this would reduce the need for schedule changes in the fall.

Similarly, it would be much more efficient to schedule incoming ninth grade students in the fall, when the Lincoln staff need only schedule those incoming students who actually appear. This is only feasible, however, if there is a gap between the scheduling process and the start of classes. One possibility that might be considered is an "open enrollment" period prior to the start of classes, during which incoming students -- both incoming ninth-graders and over-the-counter admissions -- could register for school and receive their schedules.

A possible downside to deferring a good chunk of the scheduling to the late summer or early fall is that the master schedule itself becomes less certain, as the precise number of sections of a particular class needed is settled much later than when the bulk of the scheduling is done in June. As things stand now, however, a number of teachers told us that they did not know what they would teach until September, so the consequences of an "open enrollment" period may not be that different from the current reality.

Even if fall scheduling is deemed unworkable, there still is some merit to staggering scheduling changes and the start of classes in the fall. Under the current system, counselors arrive at Lincoln in the fall just a day ahead of the students, which means that there is virtually no time to correct scheduling "errors" before the start of classes. ensuring a longer lag between when the counselors begin their work and when classes start -- either by arranging for the counselors to arrive earlier, or perhaps, for classes to start later -- would enable these errors to be fixed before classes start, thereby minimizing the disruption to students' classroom experiences. While such personnel and calendar issues are difficult to maneuver, it is at least worth considering that an earlier start date for counselors could be balanced with reduced obligations during some other part of the academic year.

Even if these suggestions prove unworkable, there still are less complex approaches that can improve the quality of the scheduling and assignment process. For example, our interviews revealed that some, but not all, guidance counselors at Lincoln make it a point to solicit alternative course choices from students that could be deployed if a student unexpectedly passed or failed the state competency test or a class. If such alternate choices were built into the pre-scheduling process, selecting courses appropriate to a student's level and/or interests might prove easier.

Additionally, the mechanisms for communications between teachers and counselors in Lincoln could be better-developed. Currently, guidance counselors solicit teacher recommendations on a haphazard basis, so that teachers' knowledge of student performance, which extends well beyond a report card mark, is not systematically taken into account in forming students' schedules. Perhaps all teachers, or those teaching subjects with sequential courses, could be asked to fill out a form in the spring recommending the "next step", or next course in their subject area, for each student in their classes. Conversely, we learned that teachers rarely learn what courses their students are subsequently scheduled for, and thus are unable to act to correct what they might view as clear errors or inappropriate judgments in students' schedules. Providing either complete student schedules, or just those courses in a teacher's subject area, to teachers for all of their students would enable them to catch scheduling problems earlier in the process, before students spend time in inappropriate classes.

Roosevelt High School

Overview of Roosevelt High School

Roosevelt High School is the only high school in a Northeastern town of about 39,000 which has experienced a declining industrial base and an increasingly aging population in recent years. Although the population of the town is only about fifty percent Hispanic, the student body of the high school is over 75% Hispanic, with another 12% being black and 12% being white. Student mobility is high, and the school's annual dropout rate of about 13% is much higher than the state average. Over half of the 1600 students in the school require special services: 15% are eligible for bilingual programs, and over a third are eligible for state compensatory education services.

Occupying a facility that was built in the early seventies, the school, which houses the ninth through twelfth grades, is "jammed" according to the principal because the school was built before the advent of mandated programs which limit class sizes in special programs and thus require more separate instructional spaces.

The Curriculum at Roosevelt High School

Roosevelt High School is a comprehensive high school with college preparatory, general, and vocational curricula. In addition, it offers a full range of special programs for at-risk students including basic skills instruction, special education, bilingual/ESL instruction, an alternative school program, and a school-within-a-school.

English

Four years of study in English are required of all students. The curriculum is organized into four one-year courses. Roosevelt had a program of electives in English in the early seventies, but staff felt that "students were losing out with it." English courses are offered at four levels: the top level which is really AP English for juniors and seniors, the academic or college prep level, the liberal or general level, and the remedial level. In addition to the basic required courses there are some courses in reading, mostly for students in grades 9 and 10. There are also some remedial writing courses and a few elective courses such as journalism , creative writing, and acting-drama left over from the electives program of the past.

Mathematics

Almost all ninth grade students take math. Possible math sequences include: 1) Basic Math, Career Math, Algebra IA, 2) BSIP (Basic Skills) Math, BSIP (Basic Skills) Math A, BSIP (Basic Skills) Math B, BSIP (Basic Skills) Review Math, 3) Algebra IA, Algebra IB, Geometry, and 4) Algebra I, Geometry, Trigonometry. Computer Science I and II are electives for students who have finished geometry. Computer Science III and IV are for "good seniors". The math curriculum was designed to meet the state requirement that every student complete two years of math in high school. That requirement has now been changed to three years of math.

Science

All ninth grade students take science. The ability levels range from low to high as follows: Science Horizons, Earth Science or Introduction to Health Careers, Introduction to Physical Science-Liberal, Introduction to Physical Science-Academic, BSCS Biology. A possible sequence might be: Science Horizons, IPS or Earth Science or Introduction to Health Careers, Biology. Biology is always taken in the tenth grade unless a student had BSCS Biology in the ninth grade. A sequence for an accelerated freshman would be: BSCS Biology, the top level chemistry class, physics (if the student is also accelerated in math and has completed Algebra II, or Anatomy or Marine Biology or AP Chemistry, and then physics.

Social Studies

Ninth graders are required to take World History, one of several options in social studies mandated by state regulations. Juniors and Seniors are required to complete American History I and American History II. These are also state requirements. There is no sophomore year social studies requirement. One teacher explained that the social studies faculty would like to do more with the sophomore year, but that other departments are also vying for time on the students' schedules. In addition to these requirements one year of economics and two years of psychology are also offered as electives.

Basic Skills

The basic skills program at Roosevelt is driven by the state competency testing program and state mandated and funded remediation. In mathematics Roosevelt offers a replacement program. Students take basic skills math instead of regular math. They could do both, but it would be rare. In English in the ninth grade, if a student is weak in communications (reading, writing, or both), the students would take basic skills English, which replaces the regular English course, and a basic skills reading course, which is supplemental. For students in the tenth, eleventh, and twelfth grades, if they fail the reading section of the state competency test and pass the writing section, they would take basic skills reading as a supplemental course. This course is titled "Reading" in the tenth grade and "Language Arts" in the eleventh and twelfth grades. If a student passes reading and fails writing, they take a supplemental writing lab in the tenth grade. A student in the same situation in the eleventh or twelfth grades would take a replacement basic skills English course. If a student fails both the reading section and the writing section of the state competency test, they would take basic skills English and reading. The majority of students end up taking one supplemental class.

Alternative School

Roosevelt High School initiated an Alternative School Program during the 1989-90 school year. The program offers an opportunity for students who look as if they will not graduate on time by staying in the regular high school program. In recent years between 30 and 90 students have participated in the program. Students in the program participate in regular high school classes until 3 P.M. After 3 P.M. they participate in Alternative School classes which are regular high school classes offered later in the day. The Alternative School is open until 5 P.M. on Tuesday through Friday and until 7 P.M. on Monday. The program is open to students in the tenth, eleventh, and twelfth grades, and allows them to catch up on credit accumulation toward graduation.

School-Within-a-School

The School-Within-a-School at Roosevelt is a program introduced during the 1991-92 school year. The program, designed for college-bound and low college-bound students, is designed to create an environment in the larger high school in which students and teachers could work together more closely. The teachers have the same lunch periods and prep periods and work with about 120 students. Students in the program are scheduled in a block for periods 1, 3, 4, 5, and 6. Periods 2 and 7 are left open so that students in the program can take music and foreign languages. Nevertheless, this block scheduling places certain additional strains on the overall scheduling process.

The Scheduling and Assignment Process at Roosevelt High School

Roosevelt High School operates a year-long schedule of courses. Unlike many other high schools in the region, it does not reschedule students and courses at mid-year. Although this presents some problems when students transfer into the school during the year from high schools with different course configurations, it appears to provide Roosevelt with a more stable set of instructional settings.

Building the Master Schedule

The master schedule is the product of several forces. Several respondents noted that basic skills is the emphasis throughout the high school program because that is "what gets monitored" by the state testing program. In addition, the state has established high school curriculum requirements specifying the kinds of courses that must be offered for the high school diploma. More recently, the state has begun to develop "core proficiencies" that must be covered in courses. Other regulations that drive the curriculum include those associated with special education and bilingual education.

The principal noted that the school has been known as a "basic skills" high school, and that the Board of Education has recently expressed interest in moving beyond the basics. He noted that a number of families in the community were sending their children to private religious or prep high schools, and that he was making an attempt to "beef up" the curriculum to lure some of them back. As an example, he cited a recent change regarding the scheduling of top level classes. In the past such classes might be dropped for low enrollments of 8 to 11 students, even though such class sizes were tolerated for lower level classes. However, "over the last few years, we managed to save Computer Science III and IV and advanced geometry for the top students even though there are low enrollments."

Other factors also influenced the curriculum and the master schedule. One such factor is past practice. As one respondent noted, "the curriculum has been like it is for a long time." Since the previous year's schedule is the starting point for planning the next year such inertia is inevitable. However, the needs of students and the community are also considered. For example, a member of the English department noted that the needs of students were a factor in the reorganization of departmental offerings away from electives. He reported that "...reading, comprehension, writing---we feel it's our function to teach these. And they weren't being met by electives." The Alternate School Program is another example of a change in the curriculum of the high school to meet the changing needs of students. The staff members who developed that program saw the need for more flexible programming for students who had to work or became pregnant and fell behind in accumulating credits toward graduation.

Competition for student time sometimes leads to a failure to address needs that are recognized as when district objectives for more advanced course work and state mandates for basic skills remediation crowd out course work in vocational areas. For example, an administrator felt that some needs were not being adequately addressed in the curriculum: "We're shooting for the college idea, preparing all students for college, and we're not getting to our students, to the many who will become service workers. Where are we addressing these students? My industrial arts and business classes should be blossoming. The business community begs me for students. But I'm not producing the students my business community wants; they're too busy flunking trigonometry, or in ninth grade taking basic skills courses, to do a shop course or something."

Each year department chairs review the offerings from the previous year and make adjustments in consultation with the guidance staff. Courses and sections may be added or dropped either by the chairs or by guidance and administration after receiving recommendations from the chairs. Several factors may influence the actual decisions about what courses and how many sections to offer. State regulations, district priorities, departmental preferences and student needs have already been noted. Occasionally, a course may be initiated because of the interest of a faculty member in teaching it. This was the case for the introduction of psychology and marine biology, but it is relatively rare.

Assigning Students to Course

Scheduling entering students. Roosevelt High School receives students from two middle schools in the district. All eighth grade students in the district take a state mandated test called the "Early Warning Test." Students who fall below the state determined cutoff for reading or math must have an individualized student improvement plan which describes the basic skills remediation program that the student is to receive. Of approximately 400 students entering in the ninth grade, over half have been scheduled for basic skills courses. However, for students entering the high school for the 1991-92 school year, the cutoff points were not set prior to the initial scheduling of students, leaving the school staff not knowing how many students would be in the basic skills program. Moreover, the individual student test scores were not known at the time of scheduling. As a result, students in basic skills courses in the middle schools were scheduled for basic skills courses at the high school. The high school staff made the necessary changes when the test scores arrived.

Entering ninth grade students are scheduled by their guidance counselors in the eighth grade. This practice is generally viewed as resulting in large numbers of scheduling problems. As one counselor noted "up here in the high school, we know the pattern of electives, what courses are generally offered what periods. We know which will fit in students' schedules, how the master schedule works. But when the junior high counselors have programmed incoming students without this information, it makes for lots of problems. I wrote this all out for the two junior high counselors, and this may help things." No one at the high school looks over the incoming students' programs until after they are scheduled. High school counselors make changes to the schedules for entering ninth graders after initial scheduling in the spring and over the summer in response to things such as test scores and acceptances into county vocational and special education programs which are communicated to the school staff in June. Such changes are made without consulting with incoming students. As one counselor put it "You might ask students in the upper grades before you changed an elective for them, but you wouldn't ask a ninth grader you probably don't know."

Students transferring into the district present additional problems. Counselors reported that transfer students will either bring a report card or come empty-handed. The lack of adequate information on such students is viewed as a problem by the staff responsible for developing schedules for these students. An additional problem is posed by Roosevelt's practice of having year-long courses. Students who passed one term of a two semester sequence in another school district must often repeat the entire year at Roosevelt since the district has no way to account for single term courses.

Scheduling existing students. The process of scheduling existing students is quite different from that process for incoming students. The counseling staff begins with group meetings with their ninth, tenth, and eleventh grade students. These meetings are followed by individual meetings with students. "Some students, especially the bright ones, are very eager and come down right away to make sure they get what they want. Most will eventually straggle in." Despite counselor efforts, not all students participate in the individual conferences. "How many students get scheduled by their counselor without meeting with them? Maybe 10%. The students who never show up [for the appointment], who will probably get thrown out for attendance anyway...but the counselors try very hard...some even write a letter home, trying to get them involved."

A number of factors enter into decisions about the assignment of students to courses. State mandated remediation through basic skills courses has already been noted as one important factor affecting scheduling. However, scheduling is completed by the end of March for the next academic year at a time when students have not even taken the state ninth grade competency test. As a result students are scheduled for basic skills courses without the benefit of the test scores that will eventually lead to the final scheduling decision. Just after Christmas department chairs send memos to all basic skills teachers asking them to identify the students who are likely to fail the test and require basic skills classes in the following year. Students are scheduled for basic skills classes based on these teacher recommendations. When the test results come back to the district in June, the counselors make the needed schedule adjustment. In making these changes they will sometimes talk with the students about what they want to take in their "freed up" periods if they passed the test and no longer must take basic skills courses. However, counselors cannot always contact students because it is so late in the year, so their preferences cannot be considered. Also, it is often too late to get into the courses that they might have selected in March.

Aside from basic skills courses, there are no clear cutoffs for determining to which levels of courses students should be assigned. A combination of test scores, grades, writing samples, and teacher recommendations is used to guide the assignment process. A typical student will be assigned to the same track as they had in the current year of a course in the absence of other information. A teacher or counselor recommendation for a change, a student request, or an expression of concern from a parent will trigger a review of the situation. Teacher recommendations are made in January and February, and scheduling is done in March. Teacher recommendations can continue to come in through the end of the year for additional changes.

The process for entering advanced placement courses is more rigorous. Advanced placement recommendations are solicited from teachers in December. Interested students are given a reading and a writing assignment. These students must also submit two teacher recommendations. They are then interviewed and a committee makes final decisions about admission to advanced placement classes.

Making Adjustments

Following the initial assignment of students to courses that takes place in March of the preceding year, there are a number of reasons why student schedules might be adjusted. The availability of test scores after the time during which student schedules are prepared has already been noted as one regular reason for substantial numbers of schedule adjustments. Avoiding such adjustments requires teachers to guess student performance on tests they have yet to take at the time of scheduling. The adjustments related to these test results are made in June when the test scores become available.

The lack of clear class placement policies also sometimes leads to the need to adjust student schedules. With the exceptions of basic skills courses and AP courses, the decision as to the appropriate level of a course for a student to take is made on the basis of teacher recommendations. This sometimes results in misplacement of students into courses that are too difficult or too easy for them. Teacher recommendations are made for all placements in basic skills and AP classes, but only for changes in level for other classes. Although most teacher recommendations appear to lead to appropriate placement, some of those interviewed explained that teachers may recommend students for courses for which they lack prerequisites or other inappropriate courses in order to fill a class so that it is not dropped from the schedule. The pressure to do just this becomes greater in departments and during times when changes in course enrollments may lead to reductions in teaching staff.

Although previous course enrollment and teacher recommendations and grades have major influences on scheduling decisions, students and their parents can also initiate requests for schedule adjustments. One counselor noted that sometimes at the middle of the year a student will request a lower section of a course if he or she is having trouble. Parents will more often inquire about moving students to higher levels of a course.

A small number of schedule adjustments are the result of decisions not to offer courses or to combine courses. A math teacher described how the school recently had to combine an honors Algebra II class with a regular Algebra II class.

Student attendance at summer school may also lead to the need to adjust a student's schedule. A student may complete a course at summer school and no longer need it in his or her school year schedule. The summer guidance staff make these changes at the conclusion of the summer school program. One counselor explained how such summer school related changes might be anticipated in developing the student's schedule in the preceding March: "If I know a student is going to need a class, but doesn't have the prerequisites, I'll schedule something else to hold the period for him in case he goes to summer school or somehow gets out of the prerequisite."

The compartmentalization of the curriculum was viewed by some as the cause of misplacement. With basic skills, AP, and three ability levels in between, Roosevelt high school has made teachers more sensitive to the placement issue. As one respondent explained, "Regarding misplacement, we've brought the problem on ourselves by creating too many compartments and then expecting students to fit in. A teacher of the top level expects students to be college-bound, so if 2 or 3 students aren't, the teacher cries 'Misplacement!'" This mixing of students that leads to such cries may be a product not only of too many levels and unclear distinctions, but also of the need to move students across levels to make schedules fit. As one counselor reported, "I do change students' level if it makes their schedules fit better...if the department chairpersons don't plan master schedules right, I may have to close class because it's too small...and assign students to a different level...if the same teacher teaches all of the Algebra IA classes and a student flunked that last term, I may put that student in Algebra I (a harder level) to avoid having the teacher again."

The Role of Students in the Scheduling and Assignment Process

Students at Roosevelt have limited control over their schedules. Students whose test scores place them in basic skills classes have no option since such classes are mandated by the state. Incoming ninth graders have very limited flexibility in their schedules both because many of them are in basic skills classes and because those not in basic skills classes must still meet state and local graduation requirements. The organization of the curriculum in full year classes at Roosevelt also removes options from students. The English electives that Roosevelt students had in the seventies have been replaced with four full year English courses that are required. The new options that have been introduced in recent years, such as the Alternative School and the School Within a School offer choice at the time of entry, but a fixed program once admitted.

Within these constraints, student interests and plans do have some affect on their schedules. Counselors reported discussing future schooling and employment plans with students as a first step in advising them on course selection. Students and their parents can and do request different levels of a class. These requests are taken seriously and considered along with other information and teacher recommendations. Requests for changes in schedules are discouraged to minimize the disruption to the school program, but legitimate requests such as those from a parent or because a student is assigned to a teacher who failed him or her before are honored.

The Role of Teachers in the Scheduling and Assignment Process

Teachers participate in the scheduling and assignment process in several ways. First, teachers are routinely asked to indicate their teaching preferences. Such preferences are honored on the basis of seniority. This does not allow for a great deal of influence, for most teachers, but as one accumulates time in the department, one has greater choice of what to teach.

Second, teachers are asked to make recommendations regarding appropriate placement of their current students in classes for the next year. Such recommendations are required for AP students and basic skills students, and for other students from whom a change in level is recommended. In making such recommendations teachers reported using their working knowledge of students, without referring to any systematic information

Third, teachers often advise students about future course taking. As one teacher explained, "Officially, it's up to guidance to do this. Unofficially, we do it because the students come to us to ask questions about courses. Sometimes they're misled by course titles, or sometimes the guidance counselors don't seem to help the students choose; they don't seem to care." Another teacher took an active part in this process, reporting that: "I very routinely ask students what they're taking next, and I have very strong opinions and try to push them. For example, there is a gifted sophomore this year, she wants to take a year off from science and then take physics as a senior. She'll have four lab sciences, but I still say a mind is a terrible thing to waste. I don't know if I'll prevail. I don't push it beyond talking with students."

Fourth, teachers can request that students who they feel are inappropriately placed in their current classes be moved. This is easier during the first marking period than later in the year. Such requests are always made through the guidance office and sometimes require approval of the department chair. However, one teacher noted the irony of being asked to recommend current students for placement next year, but not being consulted before students are placed in their classes during the current year.

The Role of Counselors and Administrators in the Scheduling and Assignment Process

Counselors play a key role in the scheduling process at Roosevelt High School. They work with department chairs to determine the master schedule of offerings. They work with individual students to arrive at schedules for subsequent years. They rework the master schedule and individual student schedules to balance classes and provide enough offerings within the staff and facilities limitations of Roosevelt High School. They receive requests for changes in current year schedules. Despite these key decision-making roles, they often report that they are constrained by state and local regulations and by the limitations of the scheduling process itself.

Administrators become involved in the scheduling and assignment process in the case of some special programs with special admissions or selection processes. They also may become involved in decisions related to resources for offering certain classes. For example, in recent years administrators have been able to allow more classes at the higher levels for small numbers of students. This reflects a Board and administration policy to move beyond the reputation of Roosevelt High School as a basic skills high school.

The Analysis of Schedule Changes at Roosevelt High School

Information on schedule changes at Roosevelt High School during the 1991-92 school year came from the school's own form, labeled "Permission to Change Program" used to record drops and adds. There was no room on this form for reasons for the schedule changes, and the guidance staff resisted using a separate form to record the reasons. However, some counselors wrote the reasons for the schedule changes in the margins of the form. The end result is that although we have a relatively complete set of schedule changes for the 1991-92 school year, we have only scattered information on the reasons for the schedule changes. Nevertheless, we examine each of the questions that have been examined for the other schools in the study, including an analysis of the small number of reasons for schedule changes available.

1. How many schedule changes were there at Roosevelt High School?

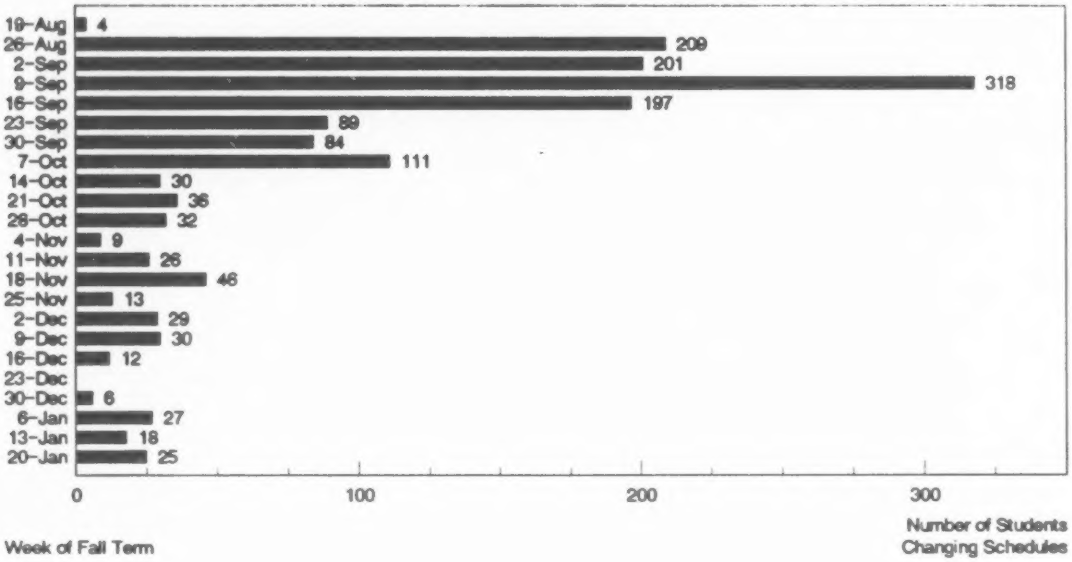
Roosevelt High School schedules students for year-long courses. However, to be consistent with the analyses for the other schools in the study, we divided the schedule changes into two periods equivalent to the fall and spring semesters at the other schools in the study. During the Fall 1991 semester there were 1552 course changes recorded at Roosevelt High School. This number exceeds the school's official enrollment of somewhat over 1400 students for this period.

During the period of time equivalent to the Spring semester, there were 441 schedule changes at Roosevelt High School. This is a substantial reduction from the Fall semester figures and reflects the scheduling of students in year-long courses. Unlike the other schools in the study, Roosevelt did not reschedule all students for the Spring semester. This apparently resulted in the need for far fewer course changes.

2. When did schedule changes take place at Roosevelt High School?

Figure 19 displays the schedule changes at Roosevelt High School according to the date on which the changes were made.

Figure 19. Distribution of Schedule
Changes at Roosevelt High School
Fall 1991



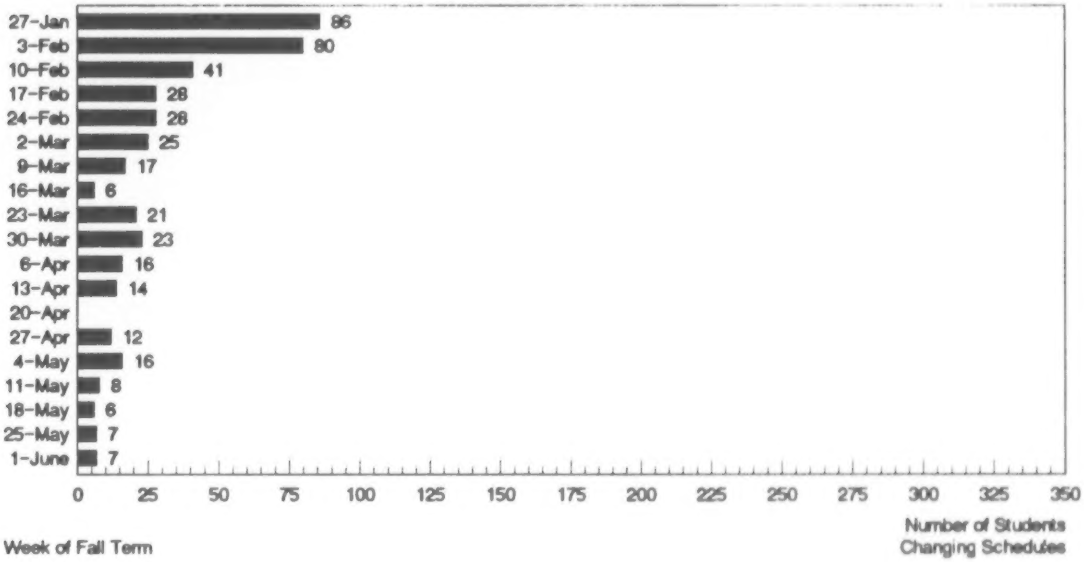
Although changes took place as early as the week of August 19th and as late as the week of January 20th, the largest volume of changes were made during the weeks of August 26th, September 2nd, September 9th, and September 16th. The week of August 26th, the week before the beginning of classes, there were 209 changes made. These changes made by guidance staff workers over the summer were to account for student work in summer school. During the week when classes began, September 2nd, 201 schedule changes were made. By far the largest volume of changes, 318, were made during the first full week of classes, the week of September 9th. For the week of September 16th, 197 schedule changes were made. Thus, nearly 60% of the schedule changes for the Fall 1991 semester were made by the week of September 16th.

During the weeks of September 23rd, September 30th, and October 7th, the volume of schedule changes declined but remained substantial with 89, 84, and 111 changes taking place during these three weeks, respectively. Over 18% of the course changes for the semester took place during these three weeks. Thus, by the end of the week of October 7th, over 78% of the course changes for the semester had taken place.

For the remaining three weeks in October another 98 schedule changes were recorded, followed by 94 more changes in November, 77 more changes in December, and 70 more changes in January. Thus, 241 schedule changes were made after the first two months, September and October, had been completed.

Figure 20 indicates the timing of schedule changes for the period of the Spring 1992 semester at Roosevelt High School.

Figure 20. Distribution of Schedule Changes at Roosevelt High School Spring 1992



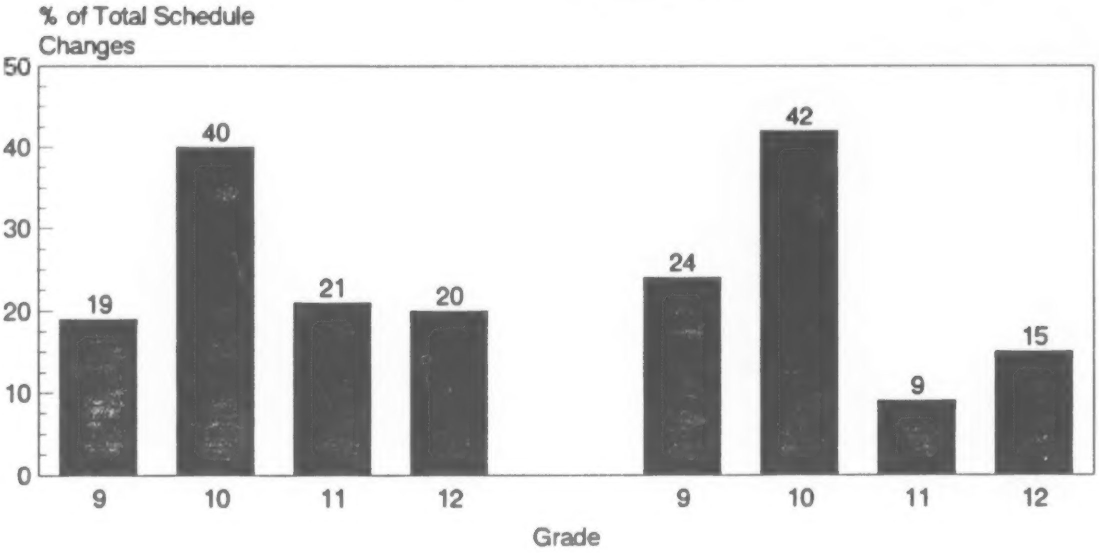
The weeks of January 27th, and February 3rd, about the time of the semester break in the other schools in our study, there were 86 and 80 schedule changes, respectively. The volume of changes declines in the four weeks following with 41 changes during the week of February 10th, 28 during each of the weeks of February 17th, and February 24th, and 25 during the week of March 2nd. Thus, by the end of the week of March 2nd, 288 course changes or over 65% of the Spring semester course changes had been recorded.

Course changes continue to occur throughout March, April, and May, and even into June as students drop courses as the year draws to a close. From March 9th through the first week of June another 153 course changes were recorded at Roosevelt High School. The course change process for the Spring semester begins with higher volume at the end of the January and the beginning of February, continues at a reduced rate throughout February, and then at a further reduced rate throughout March, with only small numbers during most weeks in April, and May.

3. How were schedule changes distributed across grades?

A Figure 21 indicates, in both the Fall 1991 and Spring 1992 terms, sophomores were involved in the highest percentage of schedule changes at Roosevelt High School.

Figure 21. Distribution of Schedule Changes at Roosevelt High School, by Gd.
Fall 1991 Spring 1992

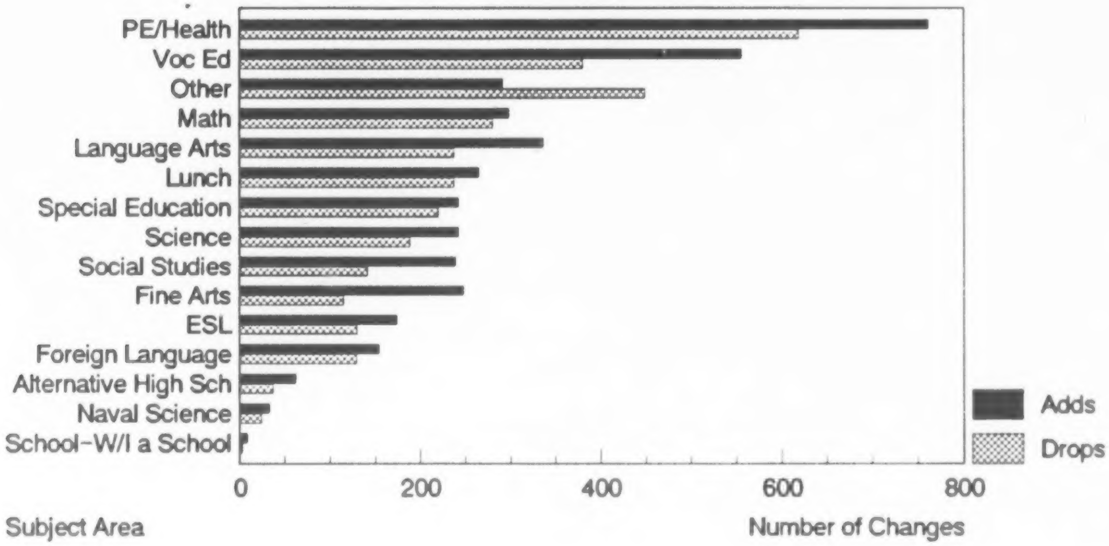


During the Fall 1991 term sophomores were involved in 40% of the schedule changes with juniors involved in 21%, seniors in 20% and freshmen in 19% of the schedule changes. During the Spring 1991 term sophomores were involved in 42% of the schedule changes, with freshman involved in 24%, seniors involved in 15% and juniors involved in 9% of the schedule changes.

4. Which subject areas were involved in the schedule changes?

Figure 22 displays the number of courses added and dropped in major subject areas during the Fall 1991 time period.

Figure 22. Number of Course Changes at Roosevelt High School by Subject Area Fall 1991



The subject areas are arranged from top to bottom beginning with the areas with the greatest number of total changes. The greatest number of changes took place in the areas of physical education and health where 619 courses were dropped and 762 were added. Vocational education accounted for the second highest number of total changes with 380 drops and 556 additions. Courses in areas other than the major ones identified accounted for 449 drops and 291 additions. Math accounted for 280 drops and 298 additions, followed by language arts (237 drops, 336 additions), lunch (237 drops, 265 additions), special education (220 drops, 242 additions), science (188 drops, 242 additions), social studies (141 drops, 239 additions), fine arts (115 drops, 248 additions), ESL (130 drops, 174 additions), foreign language (129 drops, 154 additions), the alternative high school (37 drops, 62 additions), naval science (24 drops, 33 additions), and the school-within-a-school (3 drops, 9 additions).

With the exception of the "other" category, all areas experienced a net gain in enrollments with additions exceeding drops for the term. The three areas that gained the most in enrollment were vocational education with a net gain of 176, physical education and health with a net gain of 143, and fine arts with a net gain of 133.

Figure 23 shows the number of course changes at Roosevelt High School by subject area for the Spring of 1992.

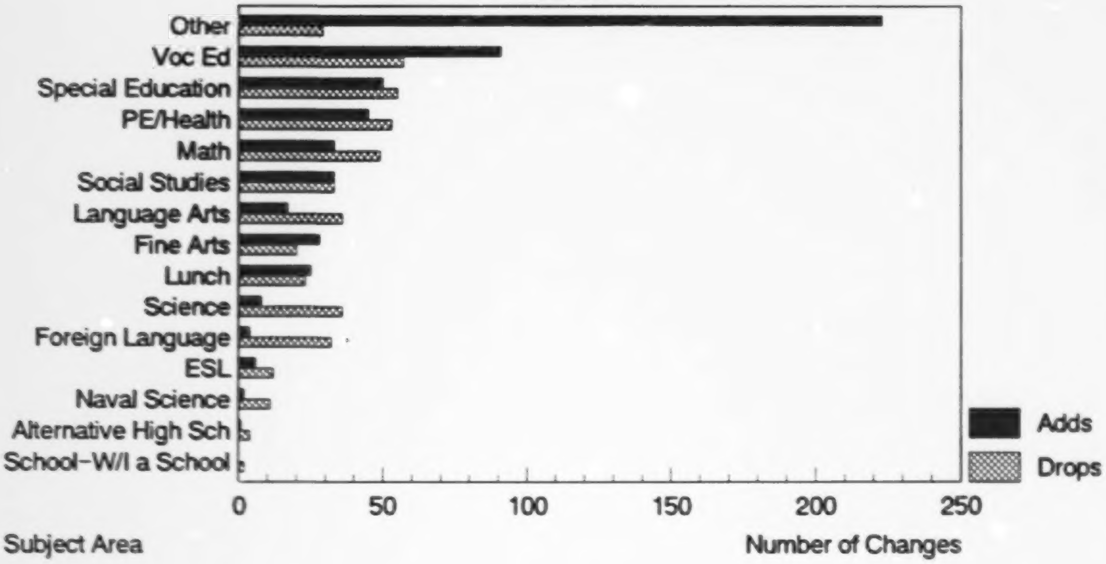


Figure 23. Number of Course Changes at Roosevelt High School by Subject Area Spring 1992

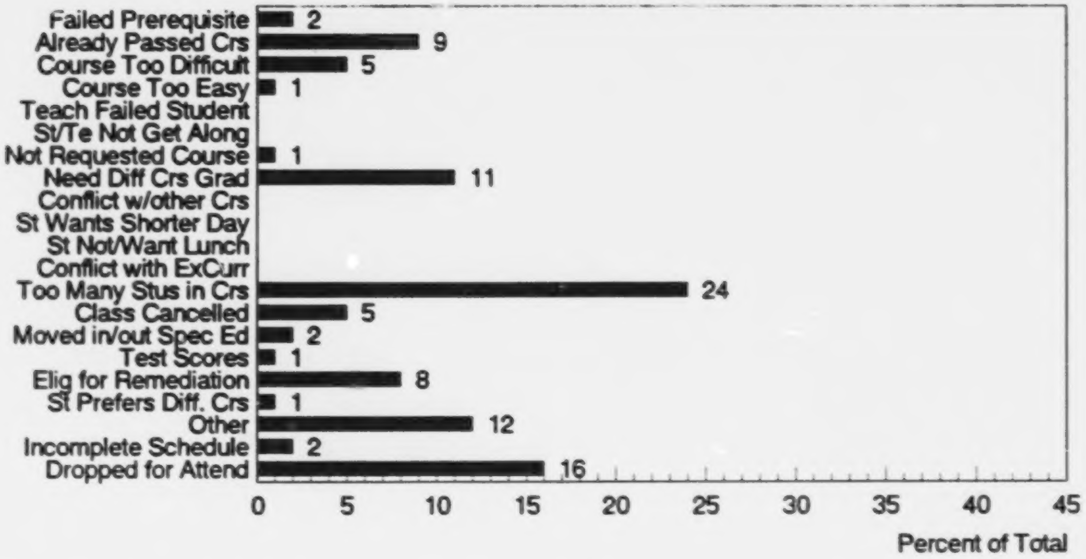
The most changes took place in subject areas other than those identified on the figure with 29 drops and 223 additions taking place in "other" areas. Vocational education was the second most active area with 57 drops and 91 additions, followed by special education (55 drops, 50 additions), physical education and health (53 drops, 45 additions), math (49 drops, 33 additions), social studies (33 drops, 33 additions), language arts (36 drops, 17 additions), fine arts (20 drops, 28 additions), lunch (23 drops, 25 additions), science (36 drops, 8 additions), foreign language (32 drops, 4 additions), ESL (12 drops, 6 additions), Naval Science (11 drops, 2 additions), the alternative high school (4 drops, 1 addition), and the School-Within-A-School (2 drops, 0 additions).

In only four subject areas did the number of additions exceed the number of drops: "other", vocational education, fine arts, and lunch. In the remaining subject areas the net change was a loss in enrollment. This suggests a pattern of students withdrawing from these year-long courses and not being able to enter courses after the middle of the year.

5. What were the reasons for the schedule changes?

Figures 24 and 25 show the reasons listed for schedule changes at Roosevelt high school. Figure 24 shows the reasons listed during the Fall 1991 semester.

Figure 24. Distribution of Reasons for Schedule Changes at Roosevelt High Schl Fall 1991 (N=100)



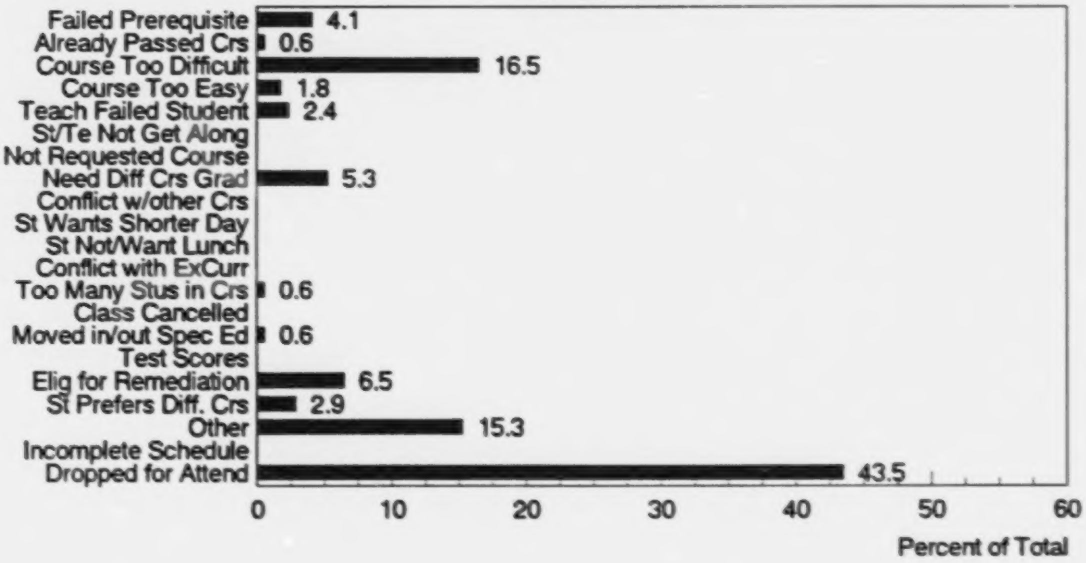
Only 100 (6.6%) of the 1522 change forms recorded during that period had reasons noted. The reason noted most frequently was that a class had too many students enrolled. This reason was noted on 24% of the schedule changes that contained reasons. The second most noted reason was that a student was being dropped from a course for poor attendance, listed on 16% of the schedule changes that contained reasons.

On 12% of the schedule changes accompanied by reasons the reason was something other than one of the reasons specified on our form. On 11% of the schedule changes accompanied by reasons, the reason given was that the student needed a different course

A student already passing a course was listed on 9% of the schedule changes that included reasons. A student being eligible for remediation was listed on 8% of the schedule changes that included reasons. A course cancellation or a course deemed too difficult by a student were each listed on 5% of the schedule changes that included reasons. No other reason appears on more than 2% of the schedule changes that included reasons during the Fall 1991 semester.

Figure 25 shows the reasons for schedule changes that appeared on the 170 (39%) of the 441 Spring 1992 schedule changes at Roosevelt High.

Figure 25. Distribution of Reasons for Schedule Changes at Roosevelt High Schl Spring 1992 (N=170)



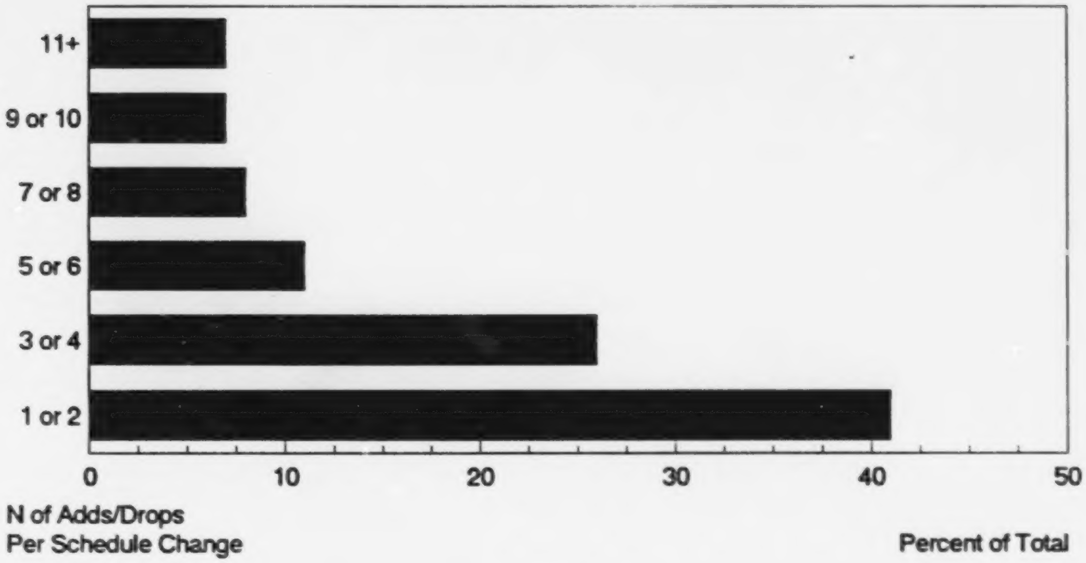
The most often noted reason for a change was dropping a course for attendance problems, listed on 43.5% of the schedule change forms that contained reasons. The second most often noted reason was that the course was too difficult for the student, listed on 16.5% of the schedule change forms accompanied by reasons. Reasons other than the ones listed specifically on our form were noted on 15.3% of the schedule change forms that contained reasons.

A student being eligible for remediation was listed on 6.5% of the schedule changes with reasons. A student needing a different course was the reason given on 5.3% of the schedule changes with reasons. Failure of a prerequisite course was the reason given on 4.1% of the schedule changes with reasons. All other reasons were listed on fewer than 3% of the schedule changes with reasons.

6. How "intense" were the schedule changes?

Once again the intensity of the schedule changes was assessed by examining the number of adds and drops that are associated with each schedule change. Figure 26 shows the distribution of the number of adds and drops per schedule change at Roosevelt High School in the fall of 1991.

Figure 26. Distribution of the Number of Adds and Drops Per Schedule Change at Roosevelt High School - Fall 1991

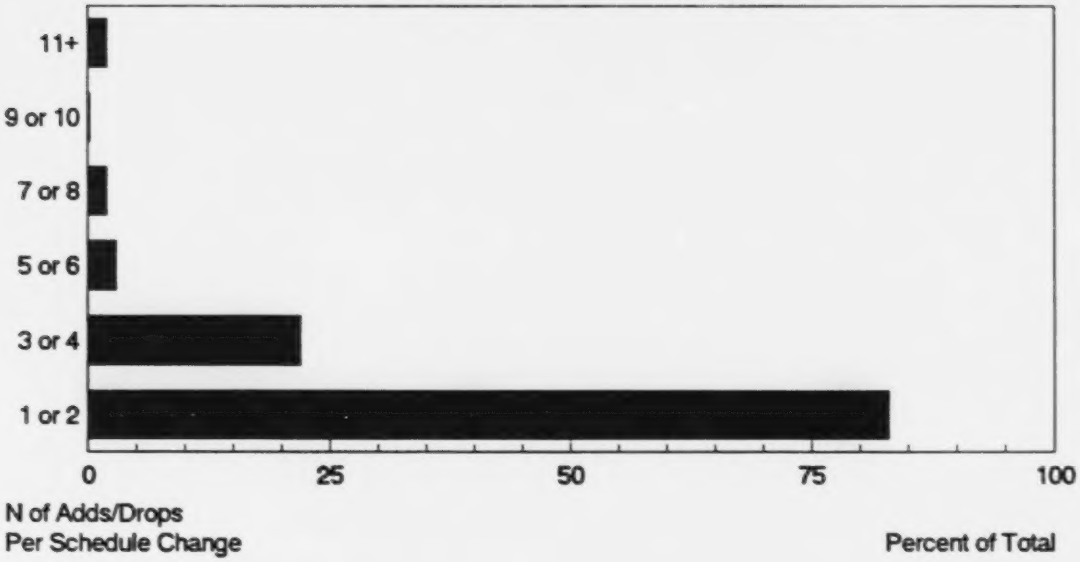


Forty-one percent of all schedule changes during that time period involved only one or two adds or drops, and another 26% involved only three or four adds or drops.

Eleven percent of the schedule changes involved 5 or 6 adds or drops, eight percent of the schedule changes involved 7 or 8 adds or drops, seven percent of the schedule changes involved 9 or 10 adds or drops and another seven percent involved eleven or more adds or drops.

Figure 27 shows the intensity of schedule changes during the spring of 1992.

Figure 27. Distribution of the Number of Adds and Drops Per Schedule Change at Roosevelt High School - Spring 1992



Eighty-three percent of the schedule changes at Roosevelt High School during this time period involved 1 or 2 adds or drops. Twenty-two percent of the schedule changes involved 3 or 4 adds or drops. Much smaller percentages of schedule changes involved more than 4 adds or drops. Three percent involved 5 or 6 adds or drops, 2% involved 7 or 8 adds or drops, 2% involved 9 or 10 adds or drops, and 2% involved eleven or more adds or drops.

Considering the fall of 1991 and the spring of 1992 at Roosevelt High School, it is clear that not only was the total number of schedule changes substantially smaller in the spring than in the fall, but also that the schedule changes that were made were less intense. Less than 20% of the schedule changes involved more than 2 adds or drops, and only a tiny fraction of the schedule changes involved more than 4 adds or drops.

Discussion and Implications

Several aspects of the scheduling and assignment process at Roosevelt High School are worthy of special notice. First, the practice of scheduling students once each year as opposed to twice each year leads to substantially greater stability than was observed in the other three schools. Even so, there were still several hundred course changes at Roosevelt High School in the spring of 1992. Many of these course changes were the result of students dropping from full-year courses for one reason or another. Because of the full-year schedule these students were often unable to add other courses to their schedule in the spring. Moreover, the full-year schedule proved to be a particularly difficult problem for transfer students entering the school in the spring from other high schools with a semester scheduling system.

Second, a number of factors appeared to lead to problems in the assignment of students to courses. Some of these were relatively fixed constraints that were built into the situation, such as the limits on the school facility and the number of staff. Others were the result of state and local policies that might be more easily adjusted, such as the state testing program schedule and the state mandates regarding assignment to remedial courses. Still others were the result of other forces that had unintended effects on the scheduling process, such as the pressure to schedule students early in the spring so that staffing decisions could be made for the next year or the pressure to schedule students into undersubscribed departments in order to maintain staff positions. Even the configuration of program offerings designed to provide students with maximum flexibility in the difficulty level of course work, the many levels of each course, sometimes operated as a constraint when it complicated an already constrained scheduling process.

Finally, we see in the process of scheduling and assigning students to courses at Roosevelt High School an explanation for an often noted problem with high school tracking practices, the stability of track placement throughout the high school careers of students. At Roosevelt, students proceeded in the same curriculum track in a subject unless information to the contrary was presented, by parents, teachers, or students themselves. From the interviews with staff, this practice appeared less related to some intentional practice of holding students in a particular place in the tracking system than to the lack of information on student performance at a level in the school where decisions on changes in course levels might be made. Thus, in the absence of any indication to the contrary, a student's current track was taken as the guide for enrollment in the coming year.

Washington High School

Overview of Washington High School

Washington High School is located close the midtown business district in a major Northeastern city. The school draws no students from the residential neighborhood in which it is located. Rather, students comes from all over the city. Of the 2800 students, approximately 52% are black, 41% are Hispanic, and the remaining 6% are Asian or white. The school has a larger than average proportion of male students: 65% of the students are male. Although Washington High is organized as a basic, comprehensive high school, it features several unique vocational programs, including a culinary arts program, an aviation program, and an elevator repair program. Recent dropout prevention services in the school have emphasized improving contact between the school and the students' homes. The school has recently invested in an extensive local area computer network and plans to make greater use of a variety of student information on the course assignment process.

The Curriculum at Washington High School

English

Four years of English are required. The English curriculum consists of eight semester course, English 1 to 8, plus some electives and remedial reading courses. Students are placed in heterogeneous English classes on the basis of graduation requirements, not on the basis of test scores. All English classes give students in-house reading diagnostics at the beginning of each term. If a student has low scores on the district Degrees of Reading Power (DRP) test, the student is assigned to Model A remedial reading along with a regular English class. If later student performance shows low grades in the regular English class, the student will be assigned to a Model B class, which is a remedial class in lieu of regular English. There is also a "Model C" in which students are block programmed for regular and remedial English, but it is technically impossible at Washington High School, because the schedule has too many singletons.

The English department has developed a "Model School Program" for incoming students. Students selected at random (every third student) are assigned to a regular English class and two other classes (word processing and a library research class). These three classes are held in one large room for three consecutive periods. Tutoring and family outreach services are also provided. Cooperative learning techniques are used.

At least one honors class in English is offered each term. To be admitted to the honors class students must have a grade of 80 to 85 and a teacher recommendation. The English department also operates a "College-Bound Program." Students opt for this program in the ninth grade. Once in the program, the stay in it for four years. Students in the program take two English classes each term, one regular class and one college-bound class.

Students may take elective courses in English in lieu of the regular English classes. A few students take a straight schedule of electives to satisfy the English requirements. Each term the English department chair publishes a list of electives that teachers are interested in and that students have expressed an interest in taking. Students apply for the electives, and, if there are enough interested students, they are offered. Students who failed a regular English class may take electives to satisfy the English requirements.

Mathematics

In the mathematics department all ninth grade students are pre-programmed for pre-algebra. All students are given a pre-evaluation during the first week of September. If they pass, they are moved out of pre-algebra and into algebra. Students who do poorly in pre-algebra are moved to the less demanding fundamental math.

The math department is organized through series of sequential courses each with prerequisites. In general the courses are not organized by ability level. One respondent noted that "honors" classes were not really honors at all, "we'll put anybody who's doing fairly well in there...use it to get rid of behavior problems, etc." Respondents noted that the information available on student performance would not allow them to assign students to classes by ability level beyond what is already done with regard to small numbers of special classes. However, other respondents pointed out that in the math department students might take the regular math sequence, fundamental math or computers or a high-end sequential math. Differences in level exist; it is unclear whether they really mean anything in terms of the assignment of students to courses, at least beyond the more specialized offerings. Courses further along in the sequence lead to classes in which students have passed through "ability screens". For example, by the time students enroll in Sequential Math 6, very few students are left in math so these classes are selective.

At Washington High all ninth and tenth grade students get double periods of math, many of which are funded as the remedial/supplemental class. This practice was begun in 1982, largely because of low test passing rates.

Washington High School also uses an experimental Comprehensive Math and Science Program (CMSP). Teachers in this program use uniform testing procedures. Exams are given on Thursdays and graded on Fridays. Results are analyzed for all teachers and students participating in the program. This program is supposed to have two math and one science components, but the science component was never implemented.

Students may have one level of mathematics and other levels of other courses. At the higher levels there is some coherence across subjects since, for example, students would be taking both physics and calculus. Prior to this there is no planned coherence across subject areas.

A problem noted in the math offerings is the high number of students who fail math courses. The high failure rate makes it difficult to anticipate and schedule math classes for the appropriate number of students. One respondent noted that the math department often waited until RCT scores were available before determining who passed and who failed a math class.

Science

Ninth grade students take General Science 1 and 2. Students who fail General Science 2 will repeat it because they must complete it to take the state competency test in science (RCT). Previously, the ratio of General Science to Regents Science students was 2:1; this year they reversed that ratio and put all students in Regents Biology unless otherwise indicated. To facilitate this change, Washington High is offering Regents Biology as a three term sequence as opposed to a two term sequence. For many Washington High students, this will be their first Regents course. A similar change is anticipated for Chemistry. Previously, students took Nutrition instead of Chemistry. Nutrition will remain, but it will no longer be the norm; it will be the exception. The plan is eventually to offer Chemistry in a three-term form like Biology.

Social Studies

The social studies curriculum includes Global Studies (area studies) I to IV as mandated by the state syllabus. If a student takes Global Studies I and fails it, but later passes Global Studies II, he will get credit for both Global Studies I and Global Studies II. This policy was instituted to allow students in Global Studies I who are still becoming acclimated to the school to regain lost ground from failing the course. The same policy pertains to Global Studies III and Global Studies IV, which together constitute the 10th grade year-long sequence in world history. At the end of Global Studies IV, students must take the RCT exam and the Regents exam. (Actually, the Regents exam is voluntary, but principles encourage all students to take it.)

After the Global Studies sequence students must take, in order: Participation in Government (1 term), one year of American history (in the spring of the junior year and the fall of the senior year), and one term of economics. After completing the first term of American history, students must take another RCT and another Regents exam.

The social studies department is also initiating a major in social studies. The major would consist of the regular four year sequence noted above plus a year's worth of electives such as law, multicultural studies, international studies, and paralegal studies. The social studies department does not presently offer an AP course, but one is under consideration.

Students who fail the RCT must receive remediation. Such remediation is done by the PM School or the night school at Washington High. There are no options for remediation in social studies during the day. The school did create "Model D" classes for Global Studies IV. These classes are smaller to allow teachers to work more closely with students to help them pass the RCT.

ESL/Bilingual

ESL is a component of the bilingual program at Washington High School. When native Spanish speakers come into the school they are tested in English, math, and native language arts. They are then programmed (in this order) into ESL, math, native language arts, and whatever else is needed. These students need two ESL classes and 1 English class, and everything else must fit around them.

There are bilingual classes available in computers, social studies, cooking, math, and English. There are about 500 students in the bilingual program.

Every Hispanic student or other non-native speaker must take the Language Assessment Battery (LAB). In the past two years Washington High has moved the cutoff score from the twenty-first percentile to the fortieth percentile so that now students scoring above the fortieth percentile are supposed to be mainstreamed. Of course, teachers have some discretion in making these decisions, and parental preferences play a role as well.

Special Education

The Special Education program at Washington High School has two main components, the self-contained program and the resource room program. The self-contained program must provide all courses that would be offered in the mainstream, i.e., the equivalent of all regular credit courses. There are 150 to 200 students in the self-contained program, although some of these students are mainstreamed a bit. The resource room program provides support through resource room teachers for special education students who are placed in regular classes. There are typically 70 to 100 students in the resource room program. Many of the special education students at Washington High School participate in the culinary arts curriculum.

Other Programs

Washington High School offers several special theme programs in vocational areas. These include programs in aviation, culinary arts, elevator repair, and automotive repair. The aviation program offers a flight class (a two-year sequence), engine shop, sheet metal shop, wood shop, and model shop.

The Scheduling and Assignment Process at Washington High School

Washington High School operates on a term or semester system in which students are scheduled for courses twice each school year.

Building the Master Schedule

The master schedule is assembled beginning with students requests to take particular courses. From these initial requests the program chair for the school determines how many sections of each course must be offered. There are enrollment caps of 34 students for regular classes, 28 for shop classes, and 24 for reading classes. However, these caps are sometimes violated. For example, as one respondent noted, "If it was 37 signed up for something, we'd only run 1 class, unless we had a very healthy budget. Conflicts would knock some out anyway."

Several factors influence the construction of the master schedule. The number of students who sign up for electives matters since a certain number are required before the course will be included in the schedule. With more and more graduation requirements, there are fewer students able to sign up for electives because they are busy fulfilling the requirements. Teacher preferences also have an impact on what gets included in the master schedule. As one respondent reported, "anybody in the school who has a course they want to teach, the administration will let them do it...but the students only want to take what they need so the problem is finding students for new courses."

After determining the number of sections, courses are assigned to periods of the school day. Some classes require special consideration. For example, some shop classes have to be scheduled at specific times to use certain rooms. Other considerations have to do with personnel. For example, one respondent involved in putting together the master schedule related that "If I know in advance that an AP will be teaching something, I will try to schedule it conveniently."

The master schedule for special education courses is developed separately from the schedule for the rest of the courses at Washington High. The school program chair simply enters into the computer scheduling system information given to him by the special education staff.

With this information loaded, the schedule itself is then created by the districtwide computer system. The output from the computer program lets the program chair know how many students have problems with their schedules. There are inevitably many problems. These often arise when students are not taking coherent sequences due to backsliding and advancing as when juniors are taking freshman level courses. Once the program chair resolves enough of these problems to be content with the master schedule, he locks it in and gives it to the assistant principals to assign teachers and rooms.

Assigning Students to Courses

Scheduling entering students. Several factors influence the assignment of incoming freshmen to courses at Washington High School. The school receives the applications of incoming freshmen which indicate their midterm junior high school grades and the courses they are taking. Washington High personnel also receive information on the special options program into which a student might have been accepted. This guides the assignment of the appropriate shop courses. Washington High staff also receive student scores on the Degrees of Reading Power (DRP) test administered district-wide. From this a determination is made as to whether students are eligible for remediation. If not eligible for remediation, students get the standard freshman curriculum. They may also be assigned to other optional courses if they request and if the school staff can schedule them.

Five counselors at Washington High School handle the large number of transfer students who enter the school each year. Most of the transfers into Washington High School are ninth graders either chronologically or, more likely, because they are older and have not yet passed out of the ninth grade courses. For the most part, they can get the courses they need when they transfer if they transfer early in the term. September and January and February, the beginning of the fall and spring terms, are months in which most transfer students enter Washington High. In assigning transfer students to courses counselors interview students and their parents, ask about former school experiences, ask for records which are rarely produced, look at a past report card if one is available, check on the student's special education status, and ask the student what he or she is interested in studying. Students receive tests in reading and math to determine if they need honors or remediation courses in these areas. Transfer students are generally admitted into the special program they want (e.g., culinary arts, elevator repair, etc.).

Transfer students present the most problems in terms of scheduling. School staff have difficulty assessing what these students have taken and where they should be assigned. Although the math and English departments give tests to assist with placement, things still go wrong. As one staff member put it, "...so the student generally loses time, credits, and gets in the wrong classes."

Scheduling existing students. The scheduling of existing students at Washington High School is handled by grade advisors, not by guidance counselors. Most grade advisors at Washington have a student load of about 300. One grade advisor explained that in scheduling existing students he is totally guided by what students are required to take and where they are in particular sequences of courses. He added that he is able to meet with all of the students in his case load because he is the grade advisor for a special program and has a reduced student case load, but that other grade advisors might not do this or be able to do this. Another grade advisor also reported attempting to meet with all of the students in his case load, although not all students actually show up for their appointments.

In scheduling students grade advisors rely on the structure of required courses and sequences and past student performance. Some advisors reported receiving some, but not many, recommendations from teachers regarding the placement of students in honors courses, electives, or regents courses. Grade advisors work with students to develop plan cards, a record of planned courses.

There are some built in dilemmas with the scheduling process at Washington High School. The special programs, elevator repair, auto repair, and culinary arts require three period shops. Since many students in these special program have academic difficulties, they must also take two periods of math and two periods of English. As one grade advisor complained, "It doesn't fit; this is even without failures! So they go to night school, summer school, or take longer to graduate."

Students and grade advisors select courses for the coming year by early June. Grade advisors rely upon students' grades in previous terms, records of credits earned, tests passed and reading level. Preliminary schedules are available within a week after this time. Teachers must inform the grade advisors of any changes the will be required when students fail second term courses. As one grade advisor put, the systems "...works IF teachers do this right -- a big 'IF'." The grade advisors then reprogram the students. Many additional changes are made in September to reflect student work in summer school.

Making Adjustments

Those interviewed cited a number of reasons for adjusting student schedules in the course of the school year. Changes in student status based on performance occur in three ways. First, students who were thought likely to pass a course but subsequently failed (or the reverse) make it necessary to adjust the schedules for the following term. Respondents reported high numbers of situations such as these. A second form of the same problem occurs when students take courses in summer school and then must have their schedules adjusted to take into account their summer school courses and credits. A third form of the problem of not having accurate information on student status concerns the original development of a student program. A staff member directly involved in scheduling made the general observation that school staff "program students inappropriately because they're not sure what they've had before." This has to do with the limited access staff responsible for scheduling have to accurate records of student past accomplishments at Washington High School and district-wide.

Another change in student status concerns student performance on test scores. Despite the fact that information on student performance from the district administered standardized testing program is necessary in order to assign students to special programs, such test results often arrive too late to be helpful to grade advisors. When these test results do become available advisors check student test scores against the courses to which they were assigned for the following term. In cases where the new test scores suggest a different assignment, advisors initiate a schedule change for students.

Changes also occur because of actions taken by the school to adjust the course offerings in light of enrollment. For example, an elective course may have to be cancelled for low enrollment. The cancellation may lead to an adjustment in student schedules often without the opportunity to consult with the students. As a result students may request additional changes after the start of the term if the course substituted for the one dropped for low enrollment is not to their liking.

Adjustments may also be made by grade advisors to accommodate students' other responsibilities. For example, one grade advisor reported allowing a student to drop her first period class so that she could take a younger sibling to school. Other grade advisors noted that they sometimes let students drop a course to allow them to get to work on time or to allow them to take care of their own children.

Schedule changes are also generally allowed so that a student can avoid a teacher with whom they have had difficulties in the past. One respondent also noted that a schedule might be changed to allow a student to "avoid a teacher who will be bad for him." Although school staff try to avoid placements that seem ill-fated from the outside, they are not in a position to match students with teacher who will be very good for the students.

One grade advisor pointed out that despite the desire of the staff to have schedule changes made early in the year, they just aren't made quickly. She went on to note that "...students might not tell you for a month that they're not where they belong' they may not even know where they below." Another respondent observed that the students were not diligent about keeping track of the requirements remaining for graduation.

Teachers also can initiate schedule changes at Washington High School. As one grade advisor explain, "sometimes a teacher will come in and ask to get a student changed due to misbehavior or something. It's happened about three times this term. I MUST get this okayed by an AP for the department."

The outcome of the large number of adjustments made in the schedules of students is problematic for the students and for the school. As one grade advisor lamented, "the impact on students is that they miss a lot; some may never catch up, some fail at first and never pass; plus the students do not know anyone if they are switched into a class later in the term."

The Role of Students in the Scheduling and Assignment Process

Students and their needs appear to exert a fair degree of influence over the scheduling and assignment process at Washington High School. As noted earlier, the number of students signing up for elective courses directly affects decisions about whether those courses will be offered. Of course, it is important to remember that most student course decisions are directed by requirements for graduation and for remediation when indicated by low test scores.

Nevertheless, the master schedule is developed from the initial requests generated by students and their grade advisors. The staff seem oriented to providing students with the courses that appear on these program requests. As the program chair noted, "I have to make sure the students get as many classes as they can, of those they requested. Student needs drive the process." When asked further about potential conflicts between student need and the interests of the school, the program chair replied, "We try to give them the classes they want...there are no conflicts with the rules here."

Indeed, there is even some indication that the school goes too far in responding to student requests. The program chair observed that "We allow the students too much leeway in scheduling. Students are deciding to do independent study in March! We should say here's your program; do it. We're not building character here."

Sometimes attempting to respond to student needs leads to more general problems with the school schedule. As one respondent pointed out: "This school tries to solve students' problems by creating new classes, but it creates problems with the schedule and anyway we might not have the right data to ensure that the placement is correct.

Students can sometimes influence the assignment process even against the rules and against their own best interests. For example, one respondent reported that "We have a girl who refuses to take classes with a particular teacher, and so she was allowed to skip American history. This is not good for the student; she needs to know American history."

Student influence extends to the selection of special programs. Students do get the special programs they want (culinary arts, elevator, etc.). They are not denied admission. This seems to occur both because staff attempt to honor student requests and in part because staff lack information on students. For example, one grade advisor pointed out that "the only way to know if the student came here as an aviation program student is if the student tells me".

Students also exert influence through requests for program changes. If a student wants a program change, the official class teacher gives the student a change request form and he/she fills it out and leaves it for the grade advisor. However, as one staff member noted, there is a problem with allowing students to initiate such changes. "One problem is that the students can't keep track of what they pass or fail." Students are allowed to drop classes if they push it by cutting and/or if they bring a note from their parents. Students meet more resistance when they are trying to change from a class because they feel it will be too hard. Some staff refuse to consider such student requests.

One reflection of the influence of students in scheduling and assignment is the movement in certain departments to make their offerings more appealing to students lest they lose enrollments and subsequently positions. For example, the social studies department is initiating a "major" in social studies to "stabilize the department and help it grow". One respondent from the social studies department described how students in special programs might be told they can defer their social studies, or take it at night school which would lead to declining enrollment in social studies and eventually the need to reduce staff positions.

The Role of Teachers in the Scheduling and Assignment Process

Teachers at Washington High School can influence the scheduling and assignment process in several ways. First, as noted earlier, teachers can influence the nature of the master schedule by volunteering to teacher certain courses. If grade advisors market these courses effectively to students and build enrollments for such electives, then they are taught.

Teachers also exert influence over the placement of students. They make recommendations about the placement of students in honors courses in several departments, including English and history. Teachers in special programs exercise some influence in deciding who will be mainstreamed. For example, ESL teachers have some discretion in deciding who will be mainsteamed even though test scores play a role in the decision. Staff in this program also play a role in deciding whether students must repeat courses. In special education, all teachers involved do participate in reviewing and updating the IEP's of students and in decisions about whether students should be mainstreamed. Even beyond the decision about mainstreaming, special education staff can ask the program office to give students specific teachers. As one respondent noted, "it's done all the time...mostly we let the program office do this their way the first time and we work around it. But we do get the program chair to change things."

Classroom teachers do have input into the process; they can say that students in their current classes need to have different level courses. However, this kind of influence over the scheduling and assignment process may be used for various reasons. As one coordinator noted "people become idiots or geniuses overnight" as teachers claim that they need to be in different levels. I think teachers do this [claim inappropriate placement] in order to get rid of students. For example, Mr. R. had six troublemakers in one class and wanted them scattered so he could teach." Another grade advisor noted that "Sometimes a teacher will come in an ask to get a student changed due to misbehavior or something. It's happened about three times this term. I must get this okayed by an AP for the department. The teacher has to learn to live with students too, so at least they must discuss it with their assistant principal." Even though their is some resistance to moving students immediately at the request of the teacher, teachers who persist tend to get the action they request.

The Role of Counselors and Administrators in the Scheduling and Assignment Process

There are several different administrative and counseling positions involved in the scheduling and assignment process at Washington High School. Grade advisors, members of the teaching staff with special assignments to work with students on their programs, do the actual programming of students into courses. Guidance counselors do the programming for incoming students and deal with students with various problems. The program chairperson at the school handles the operations of managing the computerized process for matching student requests as reflected in program forms with the master schedule of the school. The AP for Guidance develops the master schedule for the entire school. The individual in this position makes decisions about the direction of the curriculum in consultation with the principal.

In recent years there has been an attempt by the administrators led by the principal to "ratchet up" the curriculum at Washington High School. This attempt is directed at allowing students to become competitive for college admission, particularly admission to the city university. Administrators seem to believe that they can move the curriculum in this direction and influence students to go along with the move. As one administrator noted: "Students take the courses we sell. It's up to us to make these courses known and get students to take them." As an example, "We're looking for more students for the calculus track, ending in the AP exam. It all depends on attitude."

The Analysis of Schedule Changes at Washington High School

Information on schedule changes at Washington High School during the fall 1991 term came from schedule change forms produced by the school's computer system. Information on the reasons for schedule changes was recorded by school staff on a special form developed for this research project.

During the spring 1992 semester information on schedule changes was recorded on a special multi-part form created for this project. School staff entered schedule change information and the reasons for schedule changes on this single form. We received one of the multiple copies of the form produced at the time actual changes were made.

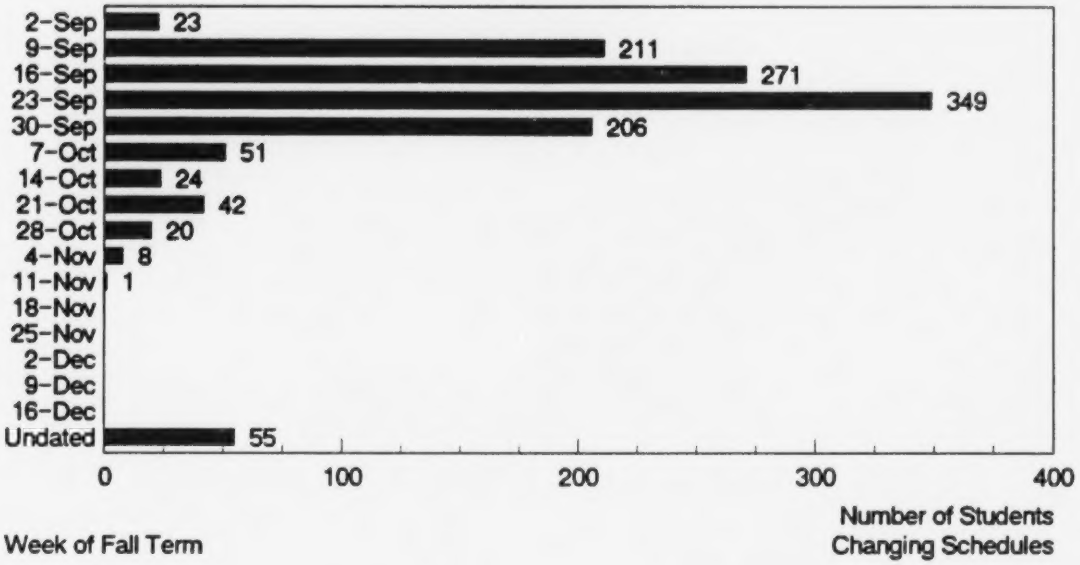
1. How many schedule changes were there at Washington High School?

Washington High School schedules students for semester-long courses twice each year. The schedule changes for the 1991-1992 school year were divided into two periods corresponding to the two semesters. During the Fall 1991 semester period there were 1261 schedule changes recorded at Washington High School. During the Spring 1992 semester period there were 1012 schedule changes recorded at Washington High.

2. When did schedule changes take place at Washington High School?

Figure 28 shows the schedule changes at Washington High School during the Fall 1991 semester according to the date on which the changes were made.

Figure 28. Distribution of Schedule
Changes at Washington High School
Fall 1991

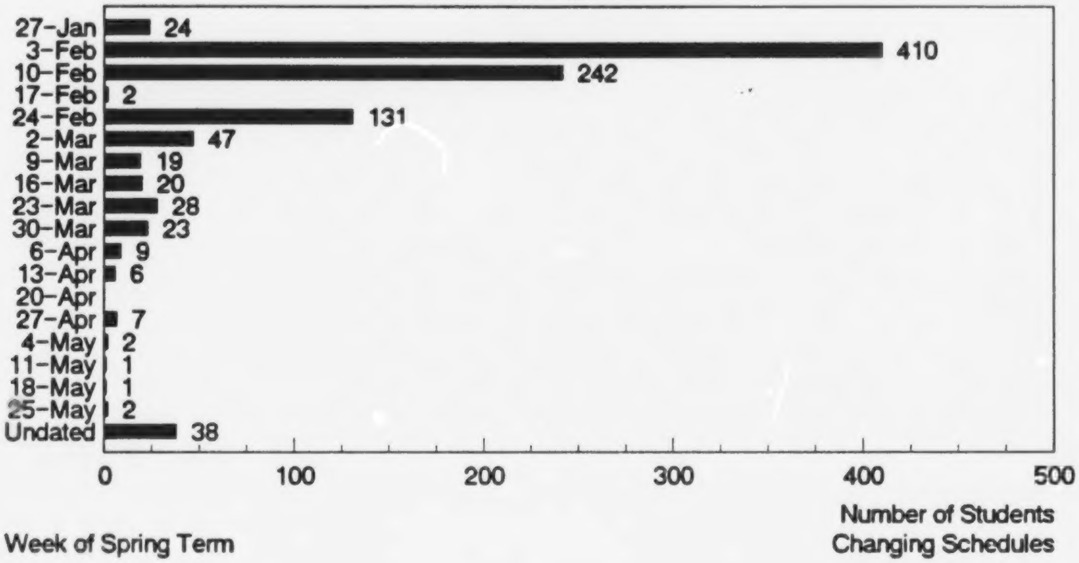


During the week of September 2nd, there were 23 schedule changes at Washington High School. The largest volume of schedule changes occurred during the four weeks of September when school was in session. During the week of September 9th, there were 211 schedule changes. For the weeks of September 16th, 23rd, and 30th, there were 271, 349, and 206 schedule changes, respectively. Nearly 88% of the schedule changes for the Fall semester took place by the beginning of October.

For the weeks of October 7th, 14th, 21st, and 28th, there were 51, 24, 42, and 20 schedule changes, respectively. Nine additional schedule changes took place in November, and 55 schedule changes were not dated.

Figure 29 displays the distribution of schedule changes at Washington High School during the Spring 1992 semester.

Figure 29. Distribution of Schedule Changes at Washington High School Spring 1992



Twenty-four schedule changes took place during the week of January 27th. By far the largest number of schedule changes, 410, took place during the week of February 3rd. The second largest number took place during the week of February 10th. Thus three weeks into the semester over two-thirds of the schedule changes had already taken place.

Only 2 schedule changes occurred during the week of February 17th. The third largest number of changes, 131, took place during the week of February 24th. After five weeks of the second semester, nearly 80% of the total schedule changes for the semester had already taken place.

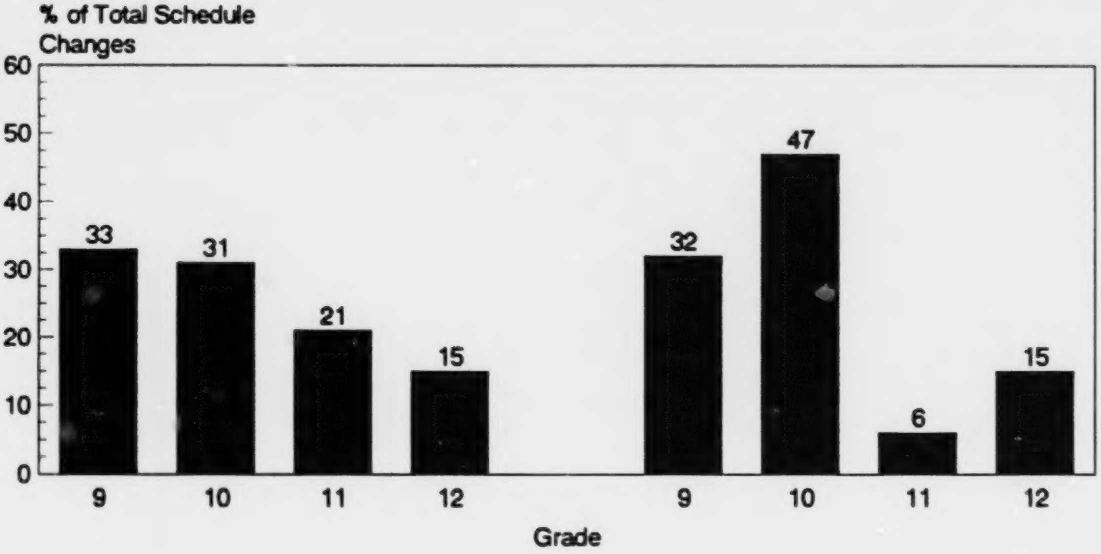
The number of schedule changes remained in the double-digit range for the month of March with 47 changes during the week of March 2nd, 19 during the week of March 9th, 20 during the week of March 16th, 28 during the week of March 23rd, and 23 during the week of March 30th.

The volume of schedule changes dropped to single digits during April and May of 1992. During the weeks of April 6th, 13th, 20th, and 27th, there were 9, 6, 0, and 7 changes, respectively. The volume declined even further during the month of May when there were a total of 6 schedule changes. In addition, there were 38 undated schedule changes.

3. How were schedule changes distributed across grades?

Figure 30 depicts the distribution of schedule changes for the Fall 1991 and Spring 1992 semesters over the four grade levels at Washington High School.

Figure 30. Distribution of Schedule Changes at Washington High School, by Gd
Fall 1991 Spring 1992



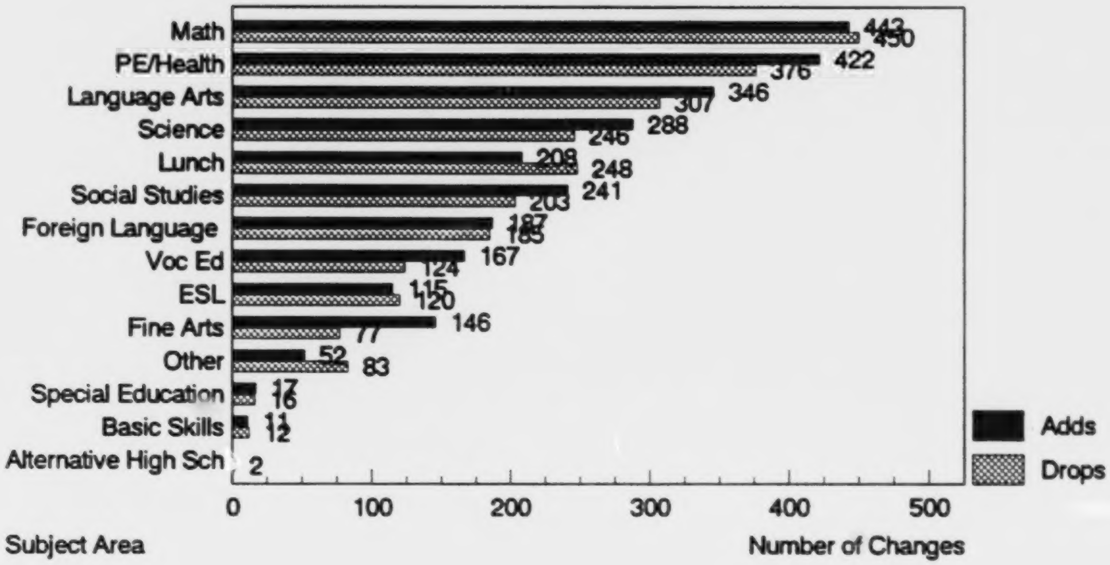
Freshmen were involved in 33% of the schedule changes that occurred during the Fall semester, followed by sophomores with 31%, juniors with 21% and seniors with 15%.

During the Spring 1992 semester, sophomores were involved in 47% of the schedule changes, followed by freshmen with 32%, seniors with 15%, and juniors with 6%.

4. Which subject areas were involved in the schedule changes?

Figure 31 depicts the Fall 1991 schedule changes that occurred in various subject areas.

Figure 31. Number of Course Changes at
Washington High School by Subject Area
Fall 1991



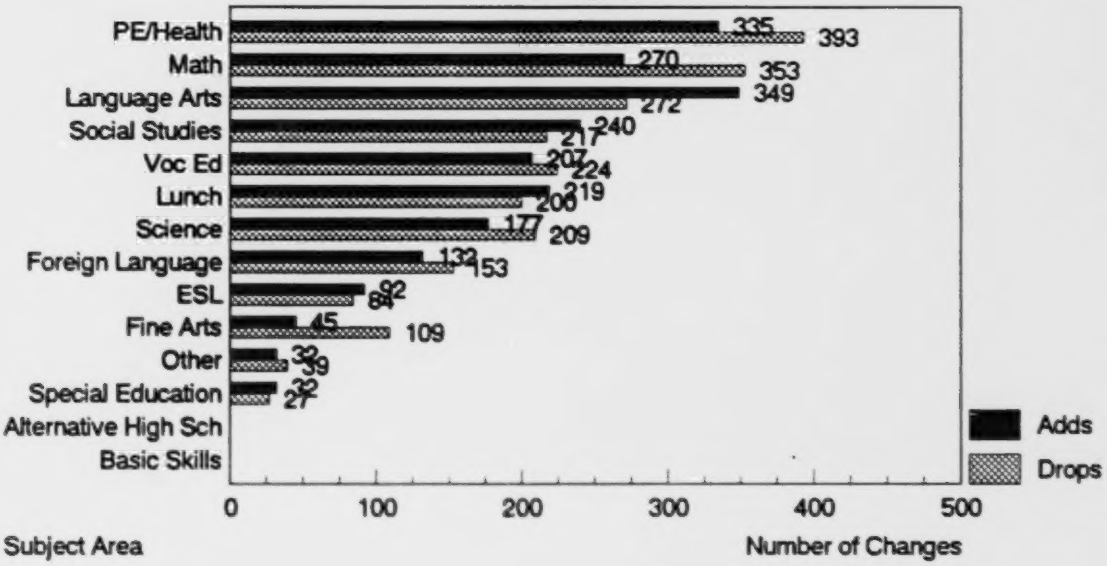
The changes are divided into courses added and courses dropped in each subject area. The most schedule changes involved the areas of math, physical education and health, language arts, and science. In each of these areas several hundred adds were made to student schedules. Courses added ranged from 288 in science to 443 in math. Courses dropped ranged from 246 in science to 450 in math.

Substantial activity also took place in the areas of lunch (208 added, 248 dropped), social studies (241 added, 203 dropped), foreign language (187 added, 185 dropped), vocational education (167 added, 124 dropped), ESL (115 added, 120 dropped), fine arts (146 added, 77 dropped).

Less schedule change activity affected other areas (52 added, 83 dropped), special education (17 added, 16 dropped), basic skills (11 added, 12 dropped), and the alternative high school program (0 added, 2 dropped).

Figure 32 shows the schedule changes that took place in these same subject ares in the Spring of 1992.

Figure 32. Number of Course Changes at Washington High School by Subject Area Spring 1992



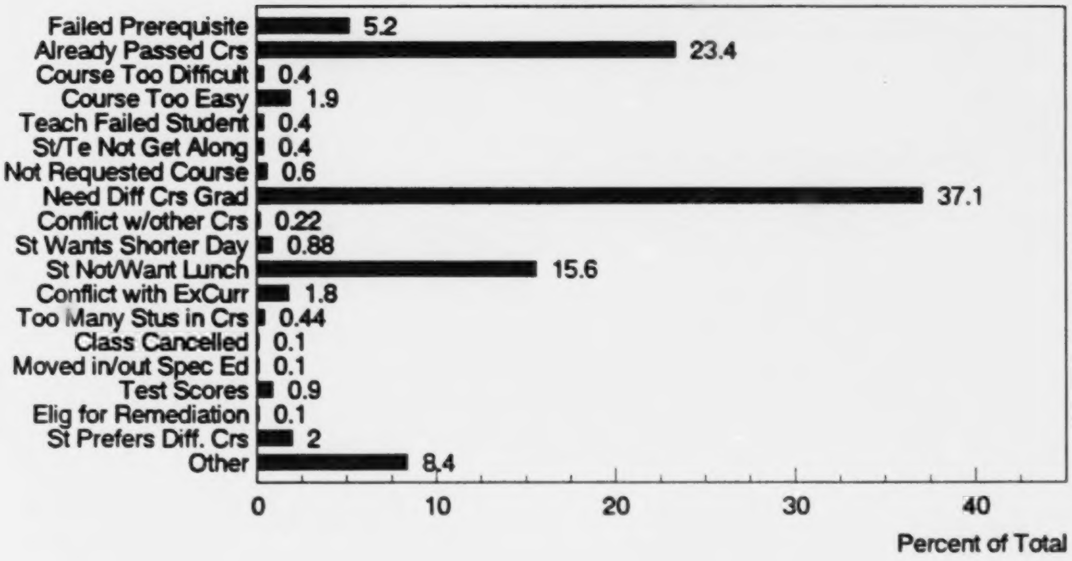
This time physical education and health experienced the most schedule change activity with 335 adds and 393 drops. Math, language arts, social studies, vocational education, and lunch each had several hundred adds and several hundred drops.

Other areas experienced less schedule change activity. The level of activity in science (177 adds, 209 drops) and foreign language (132 adds, 153 drops) was still substantial. The level of activity in ESL (92 adds, 84 drops), the fine arts (45 adds, 109 drops), other areas (32 adds, 39 drops), and special education (32 adds, 27 drops) was more modest, while there were no course changes involving the alternative high school and the basic skills area during the Spring 1992 semester.

5. What were the reasons for the schedule changes?

The reasons listed for making schedule changes in the Fall of 1991 are presented in Figure 33.

Figure 33. Distribution of Reasons for
Schedule Changes at Washington High Schl
Fall 1991 (N=905)

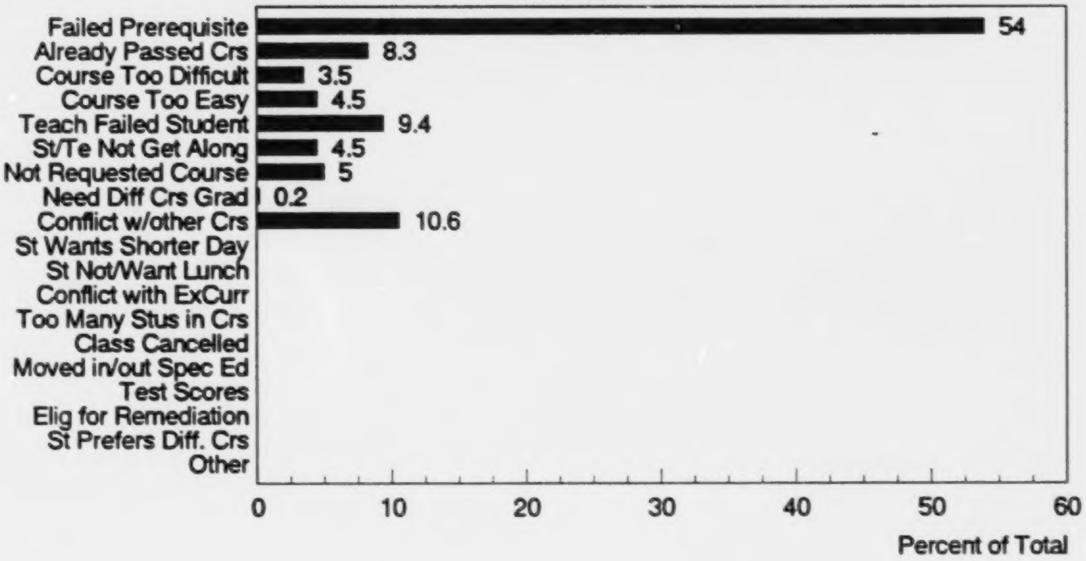


Reasons were recorded for 905 (72%) of the 1261 Fall 1991 schedule changes. The reason most often noted for schedule changes was that the student needed a different course to graduate. This reason was listed on 37.1% of the 905 schedule changes that contained reasons. The second most often noted reason was that the student had already passed the course. This reason was listed on 23.4% of the schedule changes that contained reasons. Wanting or not wanting to have a scheduled lunch was the third most cited reason. This reason was noted on 15.6% of the schedule changes that contained reasons.

A reason other than the ones identified on the schedule change forms was found on 8.4% of the forms that contained reasons. On 5.2% of the schedule change forms with reasons, the reason given was that the student had failed a prerequisite for a course. All other reasons were listed on 2% or fewer of the Fall 1991 course change forms that were accompanied by reasons.

Reasons were listed on a lower percentage of the Spring 1992 course change forms. Of the 1012 course changes that occurred during the Spring 1992 term, 424 (42%) contained reasons for the change. The 424 changes were distributed among reduced set of nine reasons. Figure 34 presents the reasons for the Spring 1992 course changes.

Figure 34. Distribution of Reasons for Schedule Changes at Washington High Schl Spring 1992 (N=424)

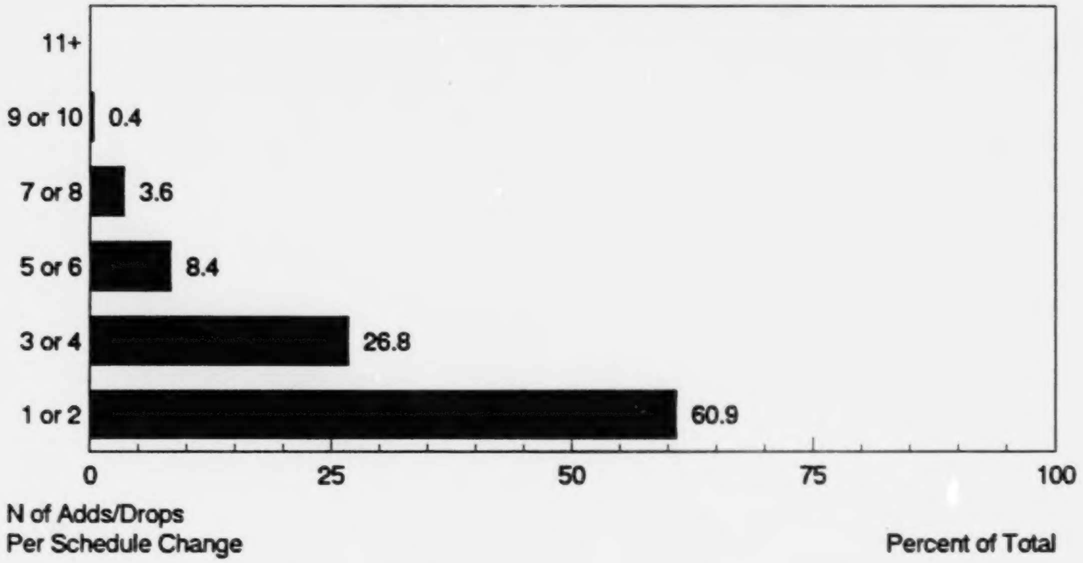


The most often noted reason was that the student had failed a prerequisite for the course. This reason appeared on 54% of the course changes that contained reasons. The second most noted reason was that a course conflicted with another course, listed on 10.6% of the course changes with reasons. The third most noted reason was that a teacher of a scheduled course had previously failed the student, listed on 9.4% of the course changes with reasons. The fourth most noted reason was that a student had already passed a course, listed on 8.3% of the schedule changes with reasons. All other reasons were noted on 5% or fewer of the course changes that contained reasons.

6. How "intense" were the schedule changes?

The intensity of the schedule changes at Washington High School is indicated in Figures 35 and 36. Figure 35 shows the distribution of the number of adds and drops per schedule change at Washington High School for the Fall 1991 semester.

Figure 35. Distribution of the Number of Adds and Drops Per Schedule Change at Washington High School – Fall 1991



Nearly sixty-one percent of the fall 1991 schedule changes at Washington High School involved only 1 or 2 adds and drops. An additional 26.8% involved 3 or 4 adds or drops. Only a little more than 12% of the schedule changes involved 5 or more adds and drops.

A similar pattern occurred for the Spring 1991 schedule changes, as Figure 26 shows.

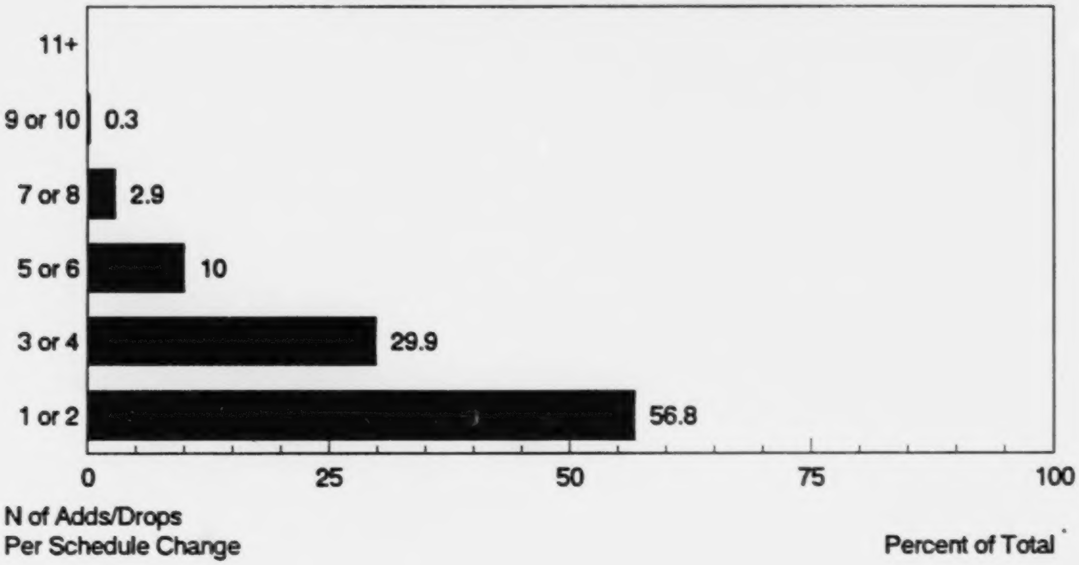


Figure 36. Distribution of the Number of Adds and Drops Per Schedule Change at Washington High School - Spring 1992

Just under 57% of the schedule changes involved 1 or 2 adds or drops. Nearly 30% of the schedule changes involved 3 or 4 adds or drops. As in the fall semester, only a little more than 12% of the schedule changes involved 5 or more adds and drops.

Discussion and Implications

Several facets of the course scheduling and assignment process at Washington High School raise more general questions. First, several processes operate to produce less than optimum course assignments from an instructional perspective. First, one process that leads to less than optimum assignment of students to courses originates with teachers who claim that students have been inappropriately placed in their classes in order to reduce the size of their classes or to eliminate students or groups of students who might pose behavior problems. Individual teachers might improve their immediate classroom situation, but usually at some cost to the students concerned as well as to teachers of other classes.

A second trend apparent in the interviews as Washington High School is the search for ways to deal with the increasingly severe time constraints on the course scheduling process. Faced with the demands for remediation, graduation requirements, and special programs, students must look for solutions outside the regular school program. At Washington High School students make use of the PM School to make-up course work and credits for graduation. In other high schools students are using five years instead of four to complete the requirements for the diploma.

A third dimension that appears in the interviews at Washington High School is the notion of competition among departments and teachers for student enrollments. As we saw at Roosevelt High, the growing pressure of state testing and graduation requirements has forced students to take increasing numbers of required courses. Although this has eliminated any competition that might have existed among departments such as math and English that form the core of requirements, it has heightened competition among departments such as music, vocational arts, and even social studies which students use to fill the few remaining spaces in their schedules. The internal competition among these departments has led some of them to initiate new curriculum efforts such as the "major" in social studies.

A fourth aspect of the scheduling and assignment process observed at Washington is the use of students as information systems. In many cases the student is the only individual in the system with the necessary information to make the scheduling and assignment process operate. Some of those interviewed noted that students did not know the graduation requirements, and that this was a problem. Others interviewers observed that the only way school staff could know about student admission to special programs was if the student told the staff member. Thus, in many cases school staff must rely on students to know not only the graduation requirements, but also their own records of course taking and passing. The fact that the two most frequently mentioned reasons for schedule changes in the fall 1992 semester are that students' needed a different course to graduate and that a student had already passed a course, suggests that this reliance on students for this information was not entirely successful. However, the entire strategy of relying upon students for these kinds of information suggests just how limited information in student performance and progress must be in Washington High School.

General Conclusions

It is instructive to consider the findings from the interviews and observations in the four high schools in light of the seven characteristics of an ideal scheduling and assignment process discussed at the outset. Our findings in these four high schools reveal congruencies as well as departures from this ideal and suggest needed changes in the scheduling process.

1. *1. Students would be assigned to courses or thematic programs in which the level of academic instruction is appropriate for their level of ability.*

The four high schools in this study differed in the degree to which they deliberately attempted to match the ability level of students with the demands of academic instruction in courses and programs. All of the schools operated under state mandates that required them to assign students to remedial instruction on the basis of state competency testing results. Most of the schools also appeared to devote time and attention to selecting students for advanced or "honors" level courses, although in some of the schools honors was a broad designation that included students who behaved well in addition to those with high ability.

Beyond the extremes of remedial and honors work, there appeared to be a great deal of confusion as to how to match student abilities to course demands. In some schools staff admitted that they might be trying to define too many ability levels with no clearly agreed upon meaning. Indeed, such fine specification of ability levels appeared to result in severe constraints on the scheduling process, constraints that were resisted when other factors took precedence over ability level in assigning students to courses.

In each of the schools there also appeared to be factors other than student ability and course demands that influenced the scheduling process. These included the limited number of spaces available in the schedule due to staff and facilities constraints, the honoring of student (or parent) requests to be placed in higher level courses, the needs of some faculty to eliminate students who might present difficulties from their classes, and the needs of other faculty to enroll sufficient numbers of students to maintain the current configuration of staff positions. Interestingly, in these schools serving at-risk students there was little evidence that staff were attempting to consign students to low track or less demanding courses beyond those dictated by state testing and remediation mandates. This is in contrast to at least some of the tracking literature. Perhaps in these schools serving large numbers of at-risk students, the pressure is to move students out of the lowest tracks.

2. Students would be assigned to courses in which the size of the class is appropriate to the type of instruction that must occur.

Class size is taken into account in several ways in the scheduling process. First, special programs with mandated class size restrictions play a large role in the scheduling process. To the extent that such size restrictions are honored, (and they are honored more often than not), they result in additional pressure on school staff and facilities resources. That is, they leave what might otherwise appear to be schools with adequate staffing ratios and adequate physical plants more constrained in the deployment of staff and the use of physical space. As the principal of Roosevelt noted, the Roosevelt building was adequate when built in the early seventies and would still be adequate today if all instruction took place in average size classes. The physical facility at Roosevelt is strained only because of the large number of mandated small classes. Thus the policy of providing appropriately smaller classes for special needs students, places an additional burden on the scheduling process for non special needs students in these comprehensive schools.

Class size also enters into the scheduling process in the budgeting decisions that undergird the construction of the master schedule. Several principals observed that in these high schools serving largely at-risk student populations, it took a deliberate administrative decision to make it possible to offer advanced courses with small enrollments. The increasing number of such small enrollment advanced courses at Roosevelt and Washington were recent developments.

Beyond the effects of mandated class size restrictions there appears to be little opportunity in the scheduling process at any of these schools to consider class size in a more fine-grained way. As classes grow in size through the scheduling process, they must reach a relatively large size before more sections are created, and even then those in charge of the scheduling process may resist sectioning a class if they believe that many of the students they are scheduling in the spring will not return to the school or will not need the particular class in the fall.

3. Students would be assigned to the appropriate combination of courses to fulfill graduation requirements and requirements for college admission and/or employment.

Staff in each of the four high schools were concerned about helping students to fulfill graduation requirements, requirements that have been growing in the wake of state reforms in recent years. However, in each of the schools, keeping track of student progress in meeting such requirements appears to be a constant battle and one in which the staffs are often trying to correct past efforts. A common reason for schedule changes was that students needed a different course to graduate.

There appear to be several reasons why meeting graduation requirements is such a difficult task. First, the four high schools lacked well organized systems for monitoring student progress toward meeting graduation requirements. Indeed, in one of the four schools, staff complained that students had little idea where they stood in terms of meeting graduation requirements, as if the staff members themselves could not be expected to keep track of such things.

Second, the programs of these four high schools were constrained by large numbers of special programs that removed flexibility from the overall scheduling process. For example, the kind of flexibility one might expect in scheduling a 1500 students comprehensive high school quickly dissipates when one fourth of those students are in special education, another fourth are in bilingual classes, and yet another fourth are in state-mandated remedial basic skills courses. One staff members likened the process to that of scheduling four or five small high schools instead of one comprehensive high school.

Third, all four of these high schools in two states are operating under increasing state standards for graduation. As a result there is less room for any kind of error in the scheduling process. Indeed, in cases where state mandated remediation is required in addition to state course taking requirements, it is impossible for students to complete even the minimal state course taking requirements in the typical four year high school period.

4. Students would be assigned to courses at times when they are most likely to attend them and perform well.

In several schools staff members involved in scheduling discussed ways in which they took student's life circumstances into account in developing schedules. For example, a student who had to walk a younger sibling to school might be given a free first period. However, in most cases these accommodations in the regular school day schedule were made as modifications in student schedules rather than as initial scheduling decisions. Thus, they typically required some disruption on the student's schedule to effect the change. Moreover, there appeared to be not systematic attempt to assess the needs of all students in this regard; counselors responded to individual student situations brought to their attention.

More general accommodations to student life circumstances requiring special time arrangements were made through special programs such as a PM school which offered a later schedule of classes or night school which offered students with full-time jobs the opportunity to continue their education. Such broad-based approaches were generally not possible within the confines of the regular school day schedule which was already strained with other mandates and limitations.

5. Students would be assigned to courses taught by teachers with whom they can work productively.

All four of the high schools had a policy of not assigning students to courses taught by teachers who had previously failed them. In some cases, however, honoring this policy meant assigning students to courses at levels other than the one that might be most appropriate. Once again, this appears to be the result of scheduling constraints.

In some of the schools counseling staff discussed the informal ways in which they attempted to match students with teachers who might be most appropriate for them. This informal matching was only possible in limited number of cases where counselors knew something about the students' needs and where the schedule offered them a choice of teaching staff.

6. Course assignments would be made for students before the beginning of the term.

In view of the large number of schedule changes processed in each of these four high schools, often exceeding the number of students enrolled, the practice of developing student schedules prior to the beginning of the term may be more ceremonial than rational. Staff in each of the four high schools spend considerable time in the spring of the proceeding year scheduling students so that every enrolled student has a schedule for the next year. However, for a variety of reasons these schedules become inappropriate and require alteration.

The major factors that lead to the need to change student schedules include test scores which become available only after initial scheduling is completed, student performance (passing or failing) courses in which they are currently enrolled, student completion of requirements in summer school, overscheduling of students to maintain staff lines, and limited information on student completion of graduation requirements. Each of these factors requires additional attention if the volume of schedule changes observed in these four high schools is to be avoided.

7. Students would be assigned to special sub-units or programs that match their academic, personal, and/or social needs.

The four high schools in the study offered various kinds of special programs designed to meet the needs of students. These programs often placed students in more stable and more personal instructional environments. Staff in these programs responsible for student course assignment and scheduling appeared to be more knowledgeable about student needs and to have small student case loads with more time to devote to addressing those needs.

However, although it appears that staff in special programs can devote more attention to meeting student needs, it is less clear that the original decisions to assign students to such special programs are based on adequate information. Indeed, in one of the four schools, staff reported relying upon students to tell them that they were in a special program since the school itself had no information on special program placement. More generally, the staff reported less organized efforts to insure that student needs and program resources are appropriately matched.

Recommendations

The patterns of activity examined in the four high schools in this study suggest a number of strategies for improving the exchange of information on students and their progress in high school that would lead to improvements in the process of matching school resources and student needs. Some of these strategies are specific to individual schools. Others would benefit most high schools. Among the latter are three that seem especially promising for improving the responsiveness of schools.

Improving Information on School Programs

First, there is a clear need to provide more accurate and more systematic information on the program offerings and requirements of the school. Despite the fact that the high schools in our study had differentiated curricula, the real significance of those differences for students was often not fully understood by school staff. Teachers reported that counselors did not fully appreciate the differences between different course levels. Counselors reported that differences between teachers were sometimes more salient in their thinking about student course assignment than differences between courses. To the extent that schools continue to offer a program of differentiated course offerings, it is important that those differences be understood accurately by staff involved in the assignment process. Moreover, it may be necessary for schools to devote more attention to calibrating and maintaining course levels, if they are to be anything more than ceremonial distinctions. Of course, the other alternative is to abandon such distinctions among course levels or reduce the number of levels so that the distinctions are clear to all concerned. In either case, the information available to guide the course assignment process should accurately reflect the offerings available to students.

Improving Information on Student Performance

A second strategy to improve the matching of school resources and student needs is to improve the availability of information on student performance. There are several clear ways in which this might be done.

It is clear from our interviews that information on student performance from standardized tests is available to counselors only after they have developed student schedules for the subsequent year. This results in the need to adjust the schedules of individual students to reflect their individual test performance. This can be done but only with additional staff time. However, because such testing information is available only after the master schedule is already determined, it is too late to reorganize the master schedule to reflect any changes in the performance of the student body as a whole.

This dilemma is the result of the timing of the scheduling and testing processes. Testing is typically done in the spring so as to reflect recent student performance. Scheduling is also done in the spring as a precursor to decisions about staffing requirements. As resources at the district and school levels become more constrained, the system will come to lack the flexibility to respond to emerging student needs. Given the fact that information on student course performance in the spring term and for summer school is not known until even later, it seems that the only way to enable schools to be more responsive to student needs is to defer the final scheduling process until a later time. In view of the large number of schedule changes made in September and October, this may be what is happening by default in the four high schools in this study. However, if district administrators could plan for such late scheduling and could hire additional staff in the fall to meet student needs, schools could become more responsive to student needs at the beginning of the school year.

Another aspect of providing better information on student performance is developing more efficient mechanisms to monitor student completion of graduation requirements. The schools in our study had recently been subject to new state graduation regulations, regulations which increased requirements and left staff and students with less room for error in developing schedules. The increased importance placed on scheduling decisions as a result of these new regulations requires that schools invest in better processes to track the completion of course requirements.

Developing Real Time Student Information Systems

Improving the information available on the school program and the information available on student performance will do little to enable schools to become more responsive to student needs unless there is a corresponding improvement in the systems available for processing and distributing such information. The high schools in our study had made recent investments in information processing technology. Each of the schools had access to data systems developed at the district level. One of the schools had made a substantial investment in a school-based data system. Nevertheless, in each of the schools there were clear and pressing problems in managing information in support of the course scheduling and student assignment process. Staff in each school struggled with information that was widely scattered in different locations and/or systems. Staff in each school often dealt with data that was not current. None of the schools had a system which could record transactions as they occurred. As a result, the fast-paced changes that characterized the scheduling process quickly outran the capacity of any of the systems designed to track them.

Recording and utlizing information on student performance in a timely way to benefit students and support the decisions of staff will require the development of information systems that operate in real time to record transactions as they occur. Real time information systems will permit school staff to have access to current information as the need arises.

At a time when discussions of school improvement are dominated by topics such as school-based management, restructuring, and alternative assessment techniques, it is difficult to focus attention on the seemingly mundane issue of the management of information. However, each of these more appealing reform strategies will require substantial improvement in the information management infrastructure of schools if they are to have a chance to succeed. Our current study calls attention to the need to develop in schools the capacity to collect, distribute, and utilize information if they are to become more responsive to the needs of students.

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Appendix A

Interview Questions - Fall 1991

The More Responsive High Schools Project

Person
Interviewed:____

Title/Position:____
_____

School:____
_____

Date of
Interview:____

Interview conducted
by:____

As you may know, we are talking to people about the role they play in developing the overall school program and assigning students to courses and other school resources that are part of that program.

1. To begin we would like to find out what roles you play in this assignment process. There are many aspects to putting together the school offerings and assigning students to them. So that we can focus the interview on those things that you are most involved with, we have divided the process into four sets of responsibilities. You may be involved in one or all of these. Please indicate whether you are involved in:

A. Developing and/or managing courses, programs and/or services for students. Such responsibilities might include developing new courses or curricula, managing a special program such as (use school specific example) or a service such as (use school specific example).

Involvement: yes_______ no_______ GO TO PAGE 2

B. Determining or coordinating the mix of courses, programs, and services for students. Such responsibilities might include developing the master schedule of courses, or deciding whether a certain program or service will fit in with the school's goals.

Involvement: yes_______ no_______ GO TO PAGE 7

C. Assigning students to courses, program, and/or services and assessing and modifying such assignments. Such responsibilities might include developing individual student course schedules and/or determining which students enter special programs and which are eligible for certain services.

Involvement: yes_______ no_______ GO TO PAGE 11

D. Providing information on students to support the assignment process. Such responsibilities might include generating information on students, assembling that information, and/or providing technical assistance with the production of such information and the maintenance of student records.

Involvement: yes_______ no_______ GO TO PAGE 23

SECTION A

QUESTIONS FOR PERSONS WHO DEVELOP AND/OR MANAGE COURSES, PROGRAMS AND SERVICES FOR STUDENTS

2. What is your role in developing courses, programs, or services for students? What courses, programs or services are you involved with?

_______*overall program development and management*

_______*development and/or management for a subset of programs (e.g., one department)*

_______*development and/or management for a group of students (e.g., sophomores)*

_______*development and/or management for a single course, program, or service*

3. What factors seem to influence whether courses, programs and/or services are offered in this school? Which of these is most important? For example, what determined what courses, programs, and services were added and dropped for the current academic year?

> *(Interviewer: note whether the respondent mentions state or local requirements, availability of resources (for staffing, space, equipment), teacher preferences, parent requests, tradition, and especially student needs.)*

4. A program of courses can be organized in different ways. Which of the following types of course organization are found in the area which you help develop or manage?

_______courses organized sequentially with prerequisites

_______courses organized by ability levels

_______courses organized as individual electives

_______courses organized by subject or theme

_______courses organized for particular groups of students

_______courses, programs, and services organized together for particular kinds of students

5. What kinds of information about students are considered in planning and developing courses, programs, and/or services? *(Interviewer: Probe for information on students' academic performance, ability, behavior/attendance, personal information. Probe to determine whether information is used in aggregate form, for groups for students, or for individual students. Probe for information about special students or groups of students. Probe for strengths and weaknesses of the information.)*

6. Do you use information on incoming students in planning and developing courses, programs, and services?

7. What additional information on currently enrolled and prospective or incoming students would enable you to improve your ability to develop courses, programs, or services for students?

8. In planning courses, programs, or services, do you also develop policies and processes to guide the placement of students in them? *(Interviewer: Request copies of any guidelines or criteria for student assignment to courses, programs, and services.)*

9. How rigid or fixed are these requirements? How rigid or fixed are the labels given to students which guide their assignment into courses, programs, or services?
(Probe: How rigid or fixed is the assignment of students to curricula with specific labels?
Example: Are all honors students in the honors courses? Are all the students in honors courses, honors students? Do all students in the honors track take exactly the same courses?)

10. When there is a conflict between the requirements governing the assignment of students to courses, programs, and services, and what you believe to be the best interests of the student, how does this conflict usually get resolved in this school? *(Probe: Do you become creative with the requirements? Do you enforce the requirements and hope that the student adapts?)*

11. Overall, how would you characterize the students in this school? What are they like? Is there a vision of the student body of this school that guides the development of courses, programs, and services?
(Probe: How might the courses, programs and services differ in another school?)

12. What methods do you use to assess the success of your school's efforts to plan courses, programs and services for students?

SECTION B

QUESTIONS FOR PERSONS WHO DETERMINE OR COORDINATE THE MIX OF COURSES, PROGRAMS, AND SERVICES FOR STUDENTS.

13. First, I would like to ask you a series of questions about the process of developing the master schedule or overall school program for the CURRENT academic year. First, were there any reasons why the process for this year was atypical? (IF YES, STATE REASONS AND ASK ABOUT THE MOST TYPICAL RECENT YEAR.)

14. For what group of students are you responsible for developing the master schedule or overall school program? Who is responsible for developing the schedule for the remaining groups of students? How do you coordinate your activities with those who develop the master schedule for other groups of students?

15. Please walk me through the process of developing the master schedule. *(Interviewer: Make sure you learn whether they begin by scheduling classes or sections of classes into which students are then fit or by scheduling students into the appropriate courses and then attempting to arrange the course and section offerings overall? Also, find out when it was decided whether a course would be offered or canceled.)*

16. How do you balance trying to give every student the program they want with the need to get the master schedule finalized? What kinds of problems are allowed to remain unsolved? Are particular students most affected?

17. **(ASK IF SECTION A IS NOT ADMINISTERED)** A program of courses can be organized in different ways. Which of the following types of course organization are found in your school? In what areas do each of these types of organization appear?

_______courses organized sequentially with prerequisites

_______courses organized by ability levels

_______courses organized as individual electives

_______courses organized by subject or theme

_______courses organized for particular groups of students

18. Are special programs generally treated as independent add-ons to the curriculum or is there an attempt to integrate these with the regular curriculum of the school? For example, would a student's participation in a particular school service influence the way his or her course schedule is constructed?

19. How do extracurricular activities fit into the total school program? Is there some mechanism to consider student participation in such activities when planning the master schedule?

(Interviewer: Is there a period or periods for extracurricular activities? Are individual student schedules developed with some knowledge of student involvement in extracurricular activities?)

20. **(ASK IF SECTION A IS NOT ADMINISTERED)** What factors seem to influence the mix of courses, programs and/or services which are offered in this school? Which of these is most important? Which are most important? What determined which courses, programs, or services were added or dropped for the current academic year?

(Interviewer: note whether the respondent mentions state or local requirements, availability of resources (for staffing, space, equipment), teacher preferences, parent requests, tradition, and especially student needs.)

21. What information on students do you use in deciding how many sections of a particular course to offer?
(Interviewer: probe with: number of students currently enrolled in the particular course; number of students enrolled in prerequisite courses; current student performance in prerequisite courses; targets for the number of students you want to assign to the particular course)

22. What part does information on incoming freshmen play in the process of developing the master schedule?

23. What part does information on transfer students play in the process of developing the master schedule?

24. What additional information on students (current, incoming freshmen, transfers) would help you to design a more appropriate master schedule?

25. **(ASK IF SECTION A IS NOT ADMINISTERED)** Overall, how would you characterize the students in this school? What are the students like? Is there a vision of the student body of this school that guides the mix of courses, programs, and services? *(Probe: How might the courses, programs and services differ in another school?)*

26. Have you or others in the school assessed the appropriateness of the mix of special programs and services? If yes, who participated in the assessment and what did they do?

SECTION C

QUESTIONS FOR PERSONS WHO ASSIGN STUDENTS TO COURSES, PROGRAMS, AND/OR SERVICES, CHANGE ASSIGNMENTS, ASSESS THOSE ASSIGNMENTS, AND THEN DETERMINE THE ADEQUACY OF THE ASSIGNMENTS.

27. I would like to ask you some questions about the process of assigning students to courses, programs, and services for the current academic year. First, is there any reason why this year was atypical? (IF YES, NOTE REASON AND DISCUSS THE MOST TYPICAL RECENT YEAR.)

28. For what group of students are you responsible for the assignment process?

29. Please walk me through the process of assigning students to courses. Perhaps you could use a particular student as an example of how you work with students to go through the assignment process. When in the school year does all of this happen?
(Interviewer: Who made the initial assignment -- the students themselves, parents, and/or school staff? Who approved the assignments --students, parents, guidance counselor, etc.? Obtain copies of forms used.)
(Possible specific probe: Suppose that a parent came to school in the spring and said, "I want my child to be in Mr. X's biology class next year." Who would be informed about this request? How would it affect the assignment process? Or: Assume a student requests a particular course. What minimally would have to happen to ensure that he or she was assigned to it?)

30. **(ASK IF SECTION A AND B ARE NOT ADMINISTERED)** A program of courses can be organized in different ways. Which of the following types of course organization are found in your school? In what areas do each of these types of organization appear?

_______courses organized sequentially with prerequisites

_______courses organized by ability levels

_______courses organized as individual electives

_______courses organized by subject or theme

_______courses organized for particular groups of students

31. **(ASK ONLY IS SECTION A IS NOT ADMINISTERED)** To what degree do courses, programs, and services have special eligibility criteria, prerequisites, etc.? *(Interviewer: Request copies of any guidelines or criteria for student assignment to courses, programs, and services.)*

32. How are the relationships between and among courses reflected in the process of assigning students to courses? Do students get a coherent program or random assignment of classes?

33. What information on students is available at assignment time? How is it used in the assignment process? *(Interviewer: Probe to determine whether information is used in aggregate form, for groups for students, or for individual students.)*

Interviewer: Probe for:

a) students' past academic performance (course enrollment patterns, grades, promotion or retention rates);

b) information about students' progress through the curriculum and/or toward graduation (students needing advanced algebra, state course requirements for graduation);

c) ability information (test scores);

d) behavioral information (attendance rates, disciplinary actions);

e) personal information about students;

f) family background information;

g) anecdotal information from school staff (including respondent)

34. Where does this information come from?

35. What additional information on students would have been helpful in the assignment process?

36. Now, are there any differences in this process we have just discussed in the case of incoming or prospective students?

37. Are there any differences in this process we have just discussed in the case of transfer students? *(Possible specific probe: Suppose that a tenth grade student enters school in November. What kinds of information about that student are typically available? Who is responsible for constructing a program for that student? What information is used to assign that student to classes, programs, and services?)*

THE NEXT PAGES ASK ABOUT SERVICES. TURN TO PAGE 17 FOR MORE QUESTIONS ABOUT ASSIGNMENT PROCESSES.
SERVICES

38. How are students assigned to special programs or services? Please walk me through that process. Again, you may want to use a particular student as an example to illustrate the process.

> *(Interviewer: When are students assigned to special programs or services? What information on students is used in deciding to link them with special programs or services? Probe for differences pertaining to different special programs or services.)*

39. Are special programs generally treated as independent add-ons to the curriculum or is there an attempt to integrate these with the regular curriculum of the school? For example, would a student's participation in a particular school service influence the way his or her course schedule is constructed?

40. How do extracurricular activities fit into the total school program? Is there some mechanism to consider student participation in such activities when planning a student's schedule?

> *(Interviewer: Is there a period or periods for extracurricular activities? Are individual student schedules developed with some knowledge of student involvement in extracurricular activities?)*

41. How does this process differ for incoming or prospective students?

> *(Interviewer: What kind of information is generally available on such students? How does the assignment process for them compare to that for other students?*

42. How does this process differ for transfer students?

> *(Interviewer: What kind of information is generally available on such students? How does the assignment process for them compare to that for other students?*

END OF SECTION ON SERVICES. CONTINUE WITH GENERAL QUESTIONS ON ASSIGNMENT.

MORE ON ASSIGNMENT.

43. What kinds of exceptions are made in the assignment process, either for courses, programs, or services? How often are such exceptions made? For which students?

34. **(ASK IF SECTION A IS NOT ADMINISTERED)** When there is a conflict between the requirements governing the assignment of students to courses, programs, and services, and what you believe to be the best interests of the student, how does this conflict usually get resolved in this school? *(Probe: Do you become creative with the requirements? Do you enforce the requirements and hope that the student adapts?)*

CHANGES IN ASSIGNMENTS

35. Now, I would like to ask you some questions about making changes in student assignments to courses, programs and services for the current academic year. Do you keep records of the number and types of changes in student assignments that were made? (IF YES, OBTAIN DOCUMENTATION AND SUMMARY INFORMATION.)

36. Could you walk me through the process by which an assignment is changed?

(Interviewer: Be sure to ask:
When can changes be made in the student assignment process?
Who can initiate these changes, and on what basis?
Can you provide me with some examples?)

37. Are there instances in which changes are automatic?

(Interview: e.g., do you routinely look for students who begin to cut particular classes, or who received failing grades at midterm? Do you always honor requests from parents or requests made for certain reasons?)

38. Are there instances in which changes are categorically refused?

(Interviewer: e.g., when a student does not like a teacher or wants to be in a class with a friend?)

39. When a change is needed, do you feel that there generally are options available?

(Interviewer: e.g., enough different courses to slot the students in, programs or services to meet the needs of your students?)

40. Do the number and type of assignment changes differ in the fall and the spring term?

(Interviewer: Can you give me some examples? Why do you think these differences occur?)

41. About how many requests for changes did you receive for the current year?

42. What information on students is generally used when making assignment changes?

43. What additional information on students would have been helpful in deciding on assignment changes?

44. **(IF SECTION A OR SECTION B IS ADMINISTERED, ONLY ASK THE PROBE)** Overall, how would you characterize the students in this school? Is there a vision of the student body of this school that guides the development of courses, programs, and services?

(Probe: How might process of assigning students to courses, programs and services differ in another school?)

ASSESSING THE PROCESS

45. In terms of the current academic year, in general, how appropriate do you feel the student assignments were?

46. How could you tell if students were appropriately assigned to courses?

(Interviewer: e.g., was the determination made because students met entrance criteria or because they eventually had success in the courses or programs to which they had been assigned?)

47. What information on students do you have available to assess the appropriateness of their course assignments?

(Interviewer: Note sources of information, e.g., respondent's own contact with students, individual reports on students, aggregate information on students.)

48. What procedures are in place for reviewing the appropriateness of assingments and making changes:

_______before students receive their programs/schedules;

_______right at the beginning of the term; and

_______later on in the term?

49. Did any particular student or group of students experience especially inappropriate course assignments? If so, why?
(Interviewer: e.g., students being assigned to high level English courses because their reading scores were not available; students in regular English courses because there is no advanced placement English available in the school.)

50. Did any particular student or group of students experience especially inappropriate assignments to programs or services? If so, why?
(Interviewer: e.g., students being assigned to dropout prevention programs who were not at-risk; at-risk students not assigned family services)

51. How could you tell if students were appropriately assigned to programs or services?
(Interviewer: e.g., was the determination made because students met entrance criteria or because they eventually had success in the programs or services to which they had been assigned?)

52. What information on students do you have available to assess the appropriateness of their assignments to programs or services?

(Interviewer: Note sources of information, e.g., respondent's own contact with students, individual reports on students, aggregate information on students.)

53. Has the school formally assessed its success in assigning students to courses, programs, or services for the current year? If so, please describe how, and the results of the assessment.

(Interviewer: Note the techniques and data collection instruments and activities. Request copies of relevant forms.)

SECTION D

QUESTIONS FOR STAFF WHO PROVIDE INFORMATION ON STUDENTS FOR USE IN ASSIGNING STUDENTS TO COURSES, PROGRAMS, OR SERVICES

54. I would like to ask you some questions about the production and storage of information on students used in the process of developing courses, programs, and services, and in the process of assigning students to those offerings, for the current academic year. First, is there any reason why this year has been atypical? (IF YES, STATE REASON AND SELECT THE MOST TYPICAL RECENT YEAR.)

55. What kinds of information on students do you help to assemble, manage, and/or store?

(Interviewer: Probe regarding statistical information and anecdotal information on both individual students and groups of students.)

56. Which students or groups of students does this information pertain to?

(Interviewer: all students, one class, one group, etc.)

57. Where does this information originate?

(Interviewer: Probe for possible sources including self-generated, from other staff members in the school, from district staff or staff in other schools, from students and/or parents.)

58. When is this information made available to you?

59. What is the quality of this information? Do you do anything to improve the quality of the information?

(Interviewer: Probe for accuracy, completeness, etc.)

60. In what form is information on students recorded and stored?

(Interviewer: Ask the respondent to be very specific. For each type of student information, i.e., each field of information, ask whether it is stored in decentralized paper files, centralized paper files, decentralized computer files or centralized computer files. Note the location for each kind of file and the technical specifications for each computer file. Ask for copies of detailed codebooks for each computer file.)

61. How did you prepare the information so that it could be used in the student assignment process?

(Interviewer: Probe the following:
- *Did you check its accuracy or completeness:?*
- *Did you transform it from a paper to computer format or vice versa?*
- *Did you manipulate the information in any way? (e.g., select certain fields for reports, select certain subgroups for analysis, aggregate information, etc.)*
- *Did you produce any standard reports with this information? (Collect copies of any report forms.)*
- *Who else is involved in this process?)*

62. To whom do you make this information on students available?

(Interviewer: Probe for the following potential users: central district administrators, school level administrators, guidance staff, special program administrators, department chairs, teachers, students, parents.)

63. To what extent do different individuals actually make use of this information? How do they gain access to it? Are there staff to help them access this information?

(Interviewer: Probe regarding the users noted in response to questions 65 above.)

64. What complaints do you get about the information you provide for the assignment process?

65. How could the provision of information for the assignment process be improved?

(Interviewer: Probe regarding: the quality of the information; the timeliness of the information; the format of the information; the technical capabilities of the information system; special requests from users.)

66. How long is information on students kept by the school or district?

Appendix B

Interview Format - Spring 1992

School: ____

Teacher Name/Position: ____________________________

Interviewer Name: _________________________________

Date: ____

Introduction

We have been talking to other staff members in the school about the ways in which students are scheduled for classes, that is, how decisions are made about class placements.

I will be asking you questions about the placement of students in general and about the placement of student in your classes.

All of your responses will be confidential. No one outside the research team will know your responses.

Before we begin, could you please tell me what classes you are teaching this year?

1. What role do you place in the course scheduling or assignment process?

2. Do you help students select courses (or help counselors or grade advisors select them for students?

3. Do you make recommendations to the department chair, answer counselor inquiries, talk with students, encourage students to take particular courses?

4. If you play a role in the course selection process, do you ever refer to your assessments of students as you participate in the process? How?

5. Do you participate in decisions about what you will teach and when you will teach it? If so, how?

6. How do you decide that a student does not belong in one of your classes?

7. Do you ever intervene to correct what you believe to be mistakes in the assignment of students to your classes? How? What are typical problems with these assignments?

8. Do you every use other teachers' earlier assessments of student performance to justify a change? How accurate are such assessments?

9. Do you ever use your own assessments of student performance to justify a change?

10. Do you think that guidance counselors and department heads, the people most responsible for student schedules, have an accurate idea of: a) what performance level is required in your courses? b) the performance levels of the students they assign to your courses?

11. Do you know or learn what classes students in your classes are scheduled to take next?

12. If you learn what students are scheduled to take next, do you ever intervene to correct what you belive to be a mis-assignment? How? What are typical problems with these assignments? Do you ever use your assessments of student performance to justify a change?

We have discussed a number of issues. Is there anything that you would like to add about the course scheduling process in this school in general or for your classes in particular?

Appendix C

Grade Change Form

STUDENT SCHEDULE CHANGE REQUEST FORM

Student Name ______________________ ______________ ____
(Print) Last First M

Student ID Number *(4 digits)* :____:____:____:____:

Official Class :____:____:____:____:

Official Class Room :____:____:____:____:

Who initiated this request for a schedule change?

_____Student _____Student's Guidance Counselor or Grade Advisor _____Parent
_____Teacher _____Another Counselor or Advisor _____Other:____________________

COPY YOUR SCHEDULE of classes exactly as it appears on your Program Card
****
****
****

SIGN INTO the CLASSES that you were originally scheduled for, and continue to attend them until notified otherwise by your counselor
****
*****

Use an "X" to indicate the class(es) you wish to DROP
****
****
****
*****

Indicate by period the class(es) you wish to ADD to your present schedule *if possible*
Policy: For each DROP there should be at least one ADD

Using the Reason Key below, write the number of the reason for the change
***
*****
****
***

						******** ADD ********		
CODE	SEC	SUBJECT	SIGN IN	PERIOD	* DROP *	1st Choice	2nd Choice	REASON
				1				
				2				
				3				
				4				
				5				
				6				
				7				
				8				
				PM				

REASON KEY: Insert number of reason for change request on lines above

1. Student failed or didn't take prerequisite course
2. Student already passed course
3. Course is too difficult; student is failing
4. Course is too easy
5. Teacher previously failed student
6. Student and teacher don't get along
7. Student was not given the classes requested
8. Student needs a different course to pass or graduate
9. Class conflicts with another class the student wants
10. Student wants shorter day and fewer classes
11. Student wants/doesn't want lunch
12. Class conflicts with extracurricular activity or student job
13. Class has too many students
14. Class was canceled
15. Student is being moved into or out of special education classes
16. Student's test scores require placement in a different class or level
17. Student is eligible for mandated remediation
18. Student prefers a different class
19. Other:____________________

______________________________ ____________________
Signature of Person Making Request **Date**

DO NOT WRITE BELOW THIS LINE

Action taken (Check One)

____ Change Granted

____ Change Denied

____ Change Deferred

____
Counselor Signature

____
Date

OFFICE USE ONLY
DO NOT WRITE

	** DROP **		** ADD **	
Per	Code	Sec	Code	Sec
1				
2				
3				
4				
5				
6				
7				
8				
PM				